|  |  |
| --- | --- |
| **00Joint Video Experts Team (JVET)****of ITU-T SG21 WP3/21 and ISO/IEC JTC 1/SC 29**39th Meeting, Daejeon, KR, 26 June – 4 July 2025 | Document: JVET-AM\_notes\_d0 |

|  |  |
| --- | --- |
| *Title:* | **Meeting Report of the 39th Meeting of the Joint Video Experts Team (JVET),Daejeon, 26 June – 4 July 2025** |
| *Status:* | Report document from the chair of JVET |
| *Purpose:* | Report |
| *Author(s) orContacts):* | **Jens-Rainer Ohm**Institute of Communication EngineeringRWTH AachenMelatener Straße 23D-52074 Aachen | Tel:Email: | +49 241 80 27671ohm@ient.rwth-aachen.de |
| *Source:* | Chair of JVET |

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

# Summary

The Joint Video Experts Team (JVET) of ITU-T WP3/21 and ISO/IEC JTC 1/‌SC 29 held its thirty-ninth meeting during 26 June – 4 July 2025 at Daejeon Convention Complex, Republic of Korea. The meeting was held as a hybrid meeting, where remote participation was provided on best-effort basis for experts who were unable to travel.

For ISO/IEC purposes, JVET is alternatively designated ISO/IEC JTC 1/‌SC 29/‌WG 5, and this was the twentieth meeting as WG 5. The JVET meeting was held under the chairmanship of Dr Jens-Rainer Ohm (RWTH Aachen/Germany). For rapid access to particular topics in this report, a subject categorization is found (with hyperlinks) in section 2.16 of this document. It is further noted that work items which had originally been conducted by the Joint Collaborative Team on Video Coding (JCT-VC) were continued in JVET as a single joint team, and explorations towards possible future need of standardization in the area of video coding are also conducted by JVET, as negotiated by the parent bodies.

The JVET meeting began at approximately 0900 hours KST (UTC+9) on Thursday 26 June 2025. Meeting sessions were held on all days including the weekend days of Saturday and Sunday 29 and 30 June 2025, until the meeting was closed at approximately XXXX hours KST on Friday 4 July 2025. Approximately XXX people attended the JVET meeting (XXX in person and XXX remotely), and approximately XXX input documents (not counting crosschecks, reports, and summary documents), 18 AHG reports, 2 EE summary reports, X BoG report(s), and X incoming liaison document(s) were discussed. The meeting took place in coordination with a meeting of various SC29 Working Groups and Advisory Groups – where WG 5 is representing the Joint Video Coding Team(s) and their activities from the perspective of the SC 29 parent body, under whose auspices this JVET meeting was held. The subject matter of the JVET meeting activities consisted of work on further development and maintenance of the twin-text video coding technology standards *Advanced Video Coding* (AVC), *High Efficiency Video Coding* (HEVC), *Versatile Video Coding* (VVC)*, Coding-independent Code Points (Video)* (CICP), and *Versatile Supplemental Enhancement Information Messages for Coded Video Bitstreams* (VSEI), as well as related technical reports, reference software and conformance testing packages. Further important goals were reviewing the results of the Exploration Experiment (EE) on Neural Network-based Video Coding, of the EE on Enhanced Compression beyond VVC capability, of other technical input on novel aspects of video coding technology, and to plan next steps for investigation of candidate technology towards further standard development.

As a primary goal, the JVET meeting reviewed the work that had been performed in the interim period since the thirty-eighth JVET meeting in producing the following documents:

a) JVET documents

* JVET-AL1004 Errata report items for VVC, VSEI, HEVC, AVC, and Video CICP
* JVET-AL1006 HEVC additional profiles and SEI messages (Draft 3), also issued as WG 5 DAM N 349
* JVET-AL1017 Support for additional VSEI messages in AVC (Draft 2), also issued as WG 5 CDAM N 345
* JVET-AL1018 HEVC with extensions and corrections (Draft 1)
* JVET-AL2005 Additions and corrections for VVC version 4 (Draft 12), also issued as WG 5 DAM N 351
* JVET-AL2006 Additional SEI messages for VSEI version 4 (Draft 6), also issued as WG 5 DAM N 347
* JVET-AL2010 VTM and HM common test conditions and software reference configurations for SDR 4:2:0 10 bit video
* JVET-AL2019 Description of algorithms version 1 and software version 13 in neural network-based video coding (NNVC)
* JVET-AL2020 Film grain synthesis technology for video applications ed. 2 (Draft 3)
* JVET-AL2023 Exploration experiment on neural network-based video coding (EE1)
* JVET-AL2024 Exploration experiment on enhanced compression beyond VVC capability (EE2)
* JVET-AL2025 Algorithm description of Enhanced Compression Model 17 (ECM 17
* JVET-AL2026 Draft Joint Call for Evidence on video compression with capability beyond VVC, also issued as WG 5 N 355
* JVET-AL2028 Additions and corrections for VVC conformance (draft 1)
* JVET-AL2030 Optimization of encoders and receiving systems for machine analysis of coded video content (draft 89, also issued as WG 5 DTR N 354
* JVET-AL2032 Technologies under consideration for future extensions of VSEI (version 8)

b) documents produced as WG 5 documents only:

* WG 5 N 346 Disposition of comments received on ISO/IEC 23002-7:2024/CDAM1
* WG 5 N 348 Disposition of comments received on ISO/IEC 23008-2:2025/CDAM 1
* WG 5 N 350 Disposition of comments received on ISO/IEC 23090-3:2024/CDAM1
* WG 5 N 352 Text of CD ISO/IEC 23090-15:202x (3rd ed.) Conformance testing for versatile video
* WG 5 N 353 Disposition of comments received on ISO/IEC CDTR 23888-3
* WG 5 N 356 Liaison statement to ISO/IEC JTC 1/SC 29/WG 1 (JPEG) on JPEG AI and explorations on video coding

As main results, the JVET produced 16 output documents from the current meeting (update):

* JVET-AL1004 Errata report items for VVC, VSEI, HEVC, AVC, and Video CICP
* JVET-AL1006 HEVC additional profiles and SEI messages (Draft 3), also issued as WG 5 DAM N 349
* JVET-AL1017 Support for additional VSEI messages in AVC (Draft 2), also issued as WG 5 CDAM N 345
* JVET-AL1018 HEVC with extensions and corrections (Draft 1)
* JVET-AL2005 Additions and corrections for VVC version 4 (Draft 12), also issued as WG 5 DAM N 351
* JVET-AL2006 Additional SEI messages for VSEI version 4 (Draft 6), also issued as WG 5 DAM N 347
* JVET-AL2010 VTM and HM common test conditions and software reference configurations for SDR 4:2:0 10 bit video
* JVET-AL2019 Description of algorithms version 1 and software version 13 in neural network-based video coding (NNVC)
* JVET-AL2020 Film grain synthesis technology for video applications ed. 2 (Draft 3)
* JVET-AL2023 Exploration experiment on neural network-based video coding (EE1)
* JVET-AL2024 Exploration experiment on enhanced compression beyond VVC capability (EE2)
* JVET-AL2025 Algorithm description of Enhanced Compression Model 17 (ECM 17
* JVET-AL2026 Draft Joint Call for Evidence on video compression with capability beyond VVC, also issued as WG 5 N 355
* JVET-AL2028 Additions and corrections for VVC conformance (draft 1)
* JVET-AL2030 Optimization of encoders and receiving systems for machine analysis of coded video content (draft 89, also issued as WG 5 DTR N 354
* JVET-AL2032 Technologies under consideration for future extensions of VSEI (version 8)

The following 6 documents were produced as WG 5 documents only, without a corresponding JVET output document or direct repetition of their content in this meeting report (update):

* WG 5 N 346 Disposition of comments received on ISO/IEC 23002-7:2024/CDAM1
* WG 5 N 348 Disposition of comments received on ISO/IEC 23008-2:2025/CDAM 1
* WG 5 N 350 Disposition of comments received on ISO/IEC 23090-3:2024/CDAM1
* WG 5 N 352 Text of CD ISO/IEC 23090-15:202x (3rd ed.) Conformance testing for versatile video
* WG 5 N 353 Disposition of comments received on ISO/IEC CDTR 23888-3
* WG 5 N 356 Liaison statement to ISO/IEC JTC 1/SC 29/WG 1 (JPEG) on JPEG AI and explorations on video coding

For the organization and planning of its future work, the JVET established XX “ad hoc groups” (AHGs) to progress the work on particular subject areas. At this meeting, X Exploration Experiments (EE) were defined. The next eight JVET meetings were planned for 3 – 12 October 2025 under ITU-T SG21 auspices in Geneva, CH; during 14 – 23 January 2026 under ISO/IEC JTC 1/‌SC 29 auspices, to be conducted as teleconference meeting; during 24 April – 1 May 2026 under ISO/IEC JTC 1/‌SC 29 auspices in Santa Eulària, ES; during 7 – 15 July 2026 under ITU-T SG21 auspices in Geneva, CH; during 14 – 23 October 2026 under ISO/IEC JTC 1/‌SC 29 auspices in Hangzhou, CN; during January 2027 under ISO/IEC JTC 1/‌SC 29 auspices, date and location t.b.d.; during April 2027 under ITU-T SG21 auspices, date and location t.b.d.; and during July 2027 under ISO/IEC JTC 1/‌SC 29, date and location t.b.d. (extend for three-year horizon?)

The document distribution site <https://jvet-experts.org/> was used for distribution of all documents. The most recent versions of JCT-VC and JCT-3V documents can now be accessed directly via the JVET site, whereas all uploaded versions are also available from <http://wftp3.itu.int/av-arch/jctvc-site/> and <http://wftp3.itu.int/av-arch/jct3v-site/>, respectively. JVET documents are also provided via <http://wftp3.itu.int/av-arch/jvet-site/>, but as this is cannot currently be maintained as a mirror with the jvet-experts.org site, documents are typically only made available with a delay of two or three meeting cycles, to avoid that late uploads of output documents would be missing.

The reflector to be used for discussions by the JVET and all its AHGs is the JVET reflector:
jvet@lists.rwth-aachen.de hosted at RWTH Aachen University. For subscription to this list, see <https://lists.rwth-aachen.de/postorius/lists/jvet.lists.rwth-aachen.de/>.

# Administrative topics

## Organization

The ITU-T/ISO/IEC Joint Video Experts Team (JVET) is a group of video coding experts from the ITU-T Study Group 21 Visual Coding Experts Group (VCEG) and ISO/IEC JTC 1/‌SC 29/‌WG 5. The parent bodies of the JVET are ITU-T WP3/21 and ISO/IEC JTC 1/‌SC 29.

The Joint Video Experts Team (JVET) of ITU-T WP3/21 and ISO/IEC JTC 1/‌SC 29 held its thirty-ninth meeting during 26 June – 4 July 2025 at Daejeon Convention Complex, Republic of Korea. The meeting was held as a hybrid meeting, where remote participation was provided on best-effort basis for experts who were unable to travel.

It is further noted that the unabbreviated name of JVET was formerly known as “Joint Video *Exploration* Team”, but the parent bodies modified it when entering the phase of formal development of the *Versatile Video Coding* (VVC) and *Versatile Supplemental Enhancement Information Messages for Coded Video Bitstreams* (VSEI) standards, as well as associated conformance test sets, reference software, verification testing, and non-normative guidance information. Furthermore, starting from the twentieth meeting, work items which had originally been conducted by the Joint Collaborative Team on Video Coding (JCT-VC) were continued to be conducted in JVET as a single joint team, as negotiated by the parent bodies. This particularly consists of work on:

* *High Efficiency Video Coding* (HEVC) and its extensions, the development of associated conformance test sets, reference software, verification testing, and non-normative guidance information,
* Specification of *Coding-independent Code Points (Video)* (CICP), and associated technical report(s),
* Maintenance and enhancement work on the *Advanced Video Coding* (AVC) standard, associated conformance test sets and reference software.

Furthermore, explorations towards possible future need of standardization in the area of video coding are also conducted by JVET. Currently, the following topics are under investigation:

* Exploration on Neural Network-based Video Coding
* Exploration on Enhanced Compression beyond VVC capability

As requested by the parent bodies, JVET is currently also preparing a call for evidence on video compression with capability beyond existing standards.

This report contains three important annexes, as follows:

* Annex A contains a list of the documents of the JVET meeting
* Annex B contains a list of the meeting participants, consisting of two parts, (B1) in-person attendees as recorded by a sign-in sheet circulated in meeting rooms, (B2) remote attendees as recorded by the teleconferencing tool used for the meeting
* Annex C contains the meeting recommendations of ISO/IEC JTC 1/‌SC 29/‌WG 5 for purposes of results reporting to ISO/IEC.

## Meeting logistics

Information regarding logistics arrangements for the meeting had been provided via the email reflector jvet@lists.rwth-aachen.de and at <http://wftp3.itu.int/av-arch/jvet-site/2025_06_AM_Daejeon/>.

## Primary goals

As a primary goal, the JVET meeting reviewed the work that was performed in the interim period since the thirty-eighth JVET meeting in producing the following output documents:

a) JVET documents

* JVET-AL1004 Errata report items for VVC, VSEI, HEVC, AVC, and Video CICP
* JVET-AL1006 HEVC additional profiles and SEI messages (Draft 3), also issued as WG 5 DAM N 349
* JVET-AL1017 Support for additional VSEI messages in AVC (Draft 2), also issued as WG 5 CDAM N 345
* JVET-AL1018 HEVC with extensions and corrections (Draft 1)
* JVET-AL2005 Additions and corrections for VVC version 4 (Draft 12), also issued as WG 5 DAM N 351
* JVET-AL2006 Additional SEI messages for VSEI version 4 (Draft 6), also issued as WG 5 DAM N 347
* JVET-AL2010 VTM and HM common test conditions and software reference configurations for SDR 4:2:0 10 bit video
* JVET-AL2019 Description of algorithms version 1 and software version 13 in neural network-based video coding (NNVC)
* JVET-AL2020 Film grain synthesis technology for video applications ed. 2 (Draft 3)
* JVET-AL2023 Exploration experiment on neural network-based video coding (EE1)
* JVET-AL2024 Exploration experiment on enhanced compression beyond VVC capability (EE2)
* JVET-AL2025 Algorithm description of Enhanced Compression Model 17 (ECM 17
* JVET-AL2026 Draft Joint Call for Evidence on video compression with capability beyond VVC, also issued as WG 5 N 355
* JVET-AL2028 Additions and corrections for VVC conformance (draft 1)
* JVET-AL2030 Optimization of encoders and receiving systems for machine analysis of coded video content (draft 89, also issued as WG 5 DTR N 354
* JVET-AL2032 Technologies under consideration for future extensions of VSEI (version 8)

b) documents produced as WG 5 documents only:

* WG 5 N 346 Disposition of comments received on ISO/IEC 23002-7:2024/CDAM1
* WG 5 N 348 Disposition of comments received on ISO/IEC 23008-2:2025/CDAM 1
* WG 5 N 350 Disposition of comments received on ISO/IEC 23090-3:2024/CDAM1
* WG 5 N 352 Text of CD ISO/IEC 23090-15:202x (3rd ed.) Conformance testing for versatile video
* WG 5 N 353 Disposition of comments received on ISO/IEC CDTR 23888-3
* WG 5 N 356 Liaison statement to ISO/IEC JTC 1/SC 29/WG 1 (JPEG) on JPEG AI and explorations on video coding

Further important goals were reviewing the results of the EE on Neural Network-based Video Coding, of the EE on Enhanced Compression beyond VVC capability, of other technical input on novel aspects of video coding technology, and planning next steps for investigation of candidate technology towards further standard development.

## Documents and document handling considerations

### General

The document distribution site <https://jvet-experts.org/> was used for distribution of all documents.

Document registration timestamps, initial upload timestamps, and final upload timestamps are listed in Annex A of this report.

The document registration and upload times and dates listed in Annex A and in headings for documents in this report are in Paris/Geneva time. Dates mentioned for purposes of describing events at the meeting follow the KST timezone (local time in Daejeon), except as otherwise noted.

Highlighting of recorded decisions in this report is practised as follows:

* Decisions made by the group that might affect the normative content of a future standard are identified in this report by prefixing the description of the decision with the string “Decision:”.
* Decisions that affect one of the various software packages but have no normative effect on text are marked by the string “Decision (SW):”.
* Decisions that fix a “bug” in one of the test model descriptions such as VTM, HM, etc. (an error, oversight, or messiness) or in the associated software package are marked by the string “Decision (BF):”.
* Decisions that are merely editorial without effect on the technical content of a draft standard are marked by the string "Decision (Ed.):". Such editorial decisions are merely suggestions to the editor, who has the discretion to determine the final action taken if their judgment differs.
* Other parenthetical comments may be used for describing the impact or motivation of a decision. Some decisions are recorded with the word “agreed” rather than “Decision:”, especially for work items under study, non-normative, editorial and planning matters.

This meeting report is based primarily on notes taken by the JVET chair, or other experts that were appointed to chair parallel sessions. It is indicated who took the notes in review of a given category (or individual documents în a category), and by which day and time the review was conducted. The preliminary notes were also circulated publicly by ftp and http during the meeting on a daily basis. It should be understood by the reader that 1) some notes may appear in abbreviated form, 2) summaries of the content of contributions are often based on abstracts provided by contributing proponents without an intent to imply endorsement of the views expressed therein, and 3) the depth of discussion of the content of the various contributions in this report is not uniform. Generally, the report is written to include as much information about the contributions and discussions as is feasible (in the interest of aiding study), although this approach may not result in the most polished output report. Expressions such as “X.XX%” indicate that the desired results were not available at the time the information was recorded.

### Late and incomplete document considerations

The formal deadline for registering and uploading non-administrative contributions had been announced as Thursday, 19 June 2025. Any documents uploaded after 1159 hours Paris/Geneva time on Friday 20 June 2025 were considered “officially late”, with a grace period of 12 hours (to accommodate those living in different time zones of the world). The deadline does not apply to AHG reports and other such reports which can only be produced after the availability of other input documents.

All contribution documents with registration numbers higher than JVET-AM0245 were registered after the “officially late” deadline (and therefore were also uploaded late). However, some documents in the “late” range might include break-out activity reports that were generated during the meeting, or documents which were requested to be produced for the purpose of improving specification text, and are therefore better considered as report documents rather than as late contributions.

In many cases, contributions were also revised after the initial version was uploaded. The contribution document archive website retains publicly accessible prior versions in such cases. The timing of late document availability for contributions is generally noted in the section discussing each contribution in this report.

One suggestion to assist with the issue of late submissions has been to require the submitters of late contributions and late revisions to describe the characteristics of the late or revised (or missing) material at the beginning of discussion of the contribution. This has been agreed to be a helpful approach to be followed at the meeting.

The following technical design proposal contributions were registered and/or uploaded late:

* JVET-AM0XXX (a proposal on …), uploaded 06-XX,
* … .

It may be observed that some of the above-listed contributions were submissions made in response to issues that arose in discussions during the meeting or from the study of other contributions, and thus could not have been submitted by the ordinary deadline.

The following other documents not proposing normative technical content, but with some need for consideration, were registered and/or uploaded late:

* JVET-AM0XXX (a study on …), uploaded 06-XX,
* … .

All cross-verification reports at this meeting (except for JVET-AM0137) were registered late, and/or uploaded late. In the interest of brevity, these are not specifically identified here. Initial upload times for each document are recorded in Annex A of this report.

The following contribution registrations were noted that were later cancelled, withdrawn, never provided, were cross-checks of a withdrawn contribution, or were registered in error: JVET-AM0128, JVET-AM0151, JVET-AM0197, JVET-AM0207, JVET-AM0213, JVET-AM0244, JVET-AM0246, JVET-AM0268, … .

(this did not happen at the current meeting – kept for future use) The following cross-verification reports were still missing by the end of the meeting, but were uploaded later: JVET-AM0XXX, … . The following reports had not become available yet three weeks after the end of the meeting: JVET-AM0XXX, … . These were marked as withdrawn by the JVET chair, assuming the registration had become obsolete.

“Placeholder” contribution documents that were basically empty of content, or lacking any results showing benefit for the proposed technology, and obviously uploaded with an intent to provide a more complete submission as a revision, had been agreed to be considered unacceptable and to be rejected in the document management system until a more complete version was available (which would then be counted as a late contribution if the update was after the document deadline). At the current meeting, this situation did apply to document(s) JVET-AM0XXX, being initially empty of results and flagged as late in the list above, based on the time of the first reasonable document upload.

It was remarked that documents that are substantially revised after the initial upload can also be a problem, as this becomes confusing, interferes with study, and puts an extra burden on synchronization of the discussion. This can especially be a problem in cases where the initial upload is clearly incomplete, and in cases where it is difficult to figure out what parts were changed in a revision. For document contributions, revision marking is very helpful to indicate what has been changed. Also, the “comments” field on the web site can be used to indicate what is different in a revision, although participants tend to seldom notice what is recorded there.

As a general policy, missing documents were not to be presented, and late documents (and substantial revisions) could only be presented when there was a consensus to consider them and there was sufficient time available for their review. Again, an exception is applied for AHG reports, CE and HLS topic summaries, and other such reports which can only be produced after the availability of other input documents. There were no objections raised by the group regarding presentation of late contributions, although there may have been some expression of annoyance and remarks on the difficulty of dealing with late contributions and late revisions.

A few contributions may have had some problems relating to IPR declarations in the initial uploaded versions (missing declarations, declarations saying they were from the wrong companies, etc.). Any such issues were corrected by later uploaded versions in a reasonably timely fashion in all cases (to the extent of the awareness of the responsible coordinators).

Some other errors may have also noticed in other initial document uploads (wrong document numbers or meeting dates or meeting locations in headers, etc.) which were generally sorted out in a reasonably timely fashion. The document web site contains an archive of each upload.

### Outputs of the preceding meeting

All output documents of the previous meeting, particularly the meeting report JVET-AL1000, the Errata report items for VVC, VSEI, HEVC, AVC, and Video CICP JVET-AL1004, the HEVC additional profiles and SEI messages (draft 3) JVET-AL1006, the Support for additional SEI messages in AVC (draft 2) JVET-AL1017, the HEVC with extensions and corrections (draft 1) JVET-AL1018, the Additions and corrections for VVC version 4 (Draft 12) JVET-AL2005, the Additional SEI messages for VSEI version 4 (Draft 6) JVET-AL2006, the VTM and HM common test conditions and software reference configurations for SDR 4:2:0 10 bit video JVET-AL2010, the Description of algorithms version 11 and software version 13 in neural network-based video coding (NNVC) JVET-AL2019 (not delivered yet by beginning of the 39th meeting but delivered during the meeting), the Film grain synthesis technology for video applications ed. 2 (Draft 3) JVET-AL2020 (not delivered yet by beginning of the 39th meeting but delivered during the meeting), the Description of the EE on Neural Network-based Video Coding JVET-AL2023, the Description of the EE on Enhanced Compression beyond VVC capability JVET-AL2024, the Algorithm description of Enhanced Compression Model 17 (ECM 17) JVET-AL2025, the Draft Joint Call for Evidence on video compression with capability beyond VVC JVET-AL2026, the Additions and corrections for VVC conformance (draft 1) JVET-AL2028, the Optimization of encoders and receiving systems for machine analysis of coded video content (draft 9) [JVET-AL2030](https://jvet-experts.org/doc_end_user/current_document.php?id=12584), and the Technologies under consideration for future extensions of VSEI (version 8) JVET-AL2032, had been completed and those which were available were approved. In a few cases, the corresponding WG 5 N-numbered documents had not yet been uploaded, and this was requested to be done as soon as possible. The software implementations of VTM version 23.x, ECM version 17.0, and NNVC version 13.0 were also approved.

Only minor editorial issues were found in the meeting report JVET-AL1000; no need to produce an update was identified (see section 2.14 for details).

The available output documents of the previous meeting and the software had been made available in a reasonably timely fashion.

## Attendance

The list of participants in the JVET meeting can be found in Annexes B1 and B2 of this report.

The meeting was open to those qualified to participate either in ITU-T WP3/21 or ISO/IEC JTC 1/‌SC 29/‌WG 5 (including experts who had been personally invited as permitted by ITU-T or ISO/IEC policies).

Participants had been reminded of the need to be properly qualified to attend. Those seeking further information regarding qualifications to attend future meetings may contact the responsible coordinators.

It was further announced that it is necessary to register for the meeting through the ISO Meetings website for ISO/IEC experts, and through the Q6/21 rapporteur for ITU-T experts. The password for meeting access had been sent to registered participants via these channels. Links to the Zoom sessions (without the necessary password) were available in the posted meeting logistics information and the calendar of meeting sessions in the JVET web site.

The following rules were established for those participating remotely via Zoom teleconference meeting:

* Use the “hand-raising” function to enter yourself in the queue to speak (unless otherwise instructed by the session chair). If you are dialed in by phone, request your queue position verbally. The online queue will be interleaved with the room queue, though it may not always be guaranteed that the sequence perfectly follows the sequence by which hand raising occurred.
* Stay muted unless you have something to say. People are muted by default when they join and need to unmute themselves to speak. The chair may mute anyone who is disrupting the proceedings (e.g. by forgetting they have a live microphone while chatting with their family or by causing bad noise or echo).
* Identify who you are and your affiliation when you begin speaking. The same applies for speakers in the room to let online participants know who is speaking.
* Use your full name and company/organization and country affiliation in your joining information, since the participation list of Zoom would also be used to compile the online part of attendance records.
* Turn on the chat window and watch for chair communication and side commentary there as well as by audio.
* Generally, do not use video for the teleconferencing calls in order to avoid overloading internet connections; enable only voice and screen sharing.
* Extensive use of screen sharing is encouraged, to enable participants to view the presented material and the meeting notes. At times, multiple sources of screen sharing may be enabled, so it may be necessary for participants to understand that this is happening and to understand how to select which shared screen they want to see.

## Agenda

The agenda for the meeting, for the further development and maintenance of the twin-text video coding technology standards *Advanced Video Coding* (AVC), *High Efficiency Video Coding* (HEVC), *Versatile Video Coding* (VVC)*, Coding-independent Code Points (Video)* (CICP), and *Versatile Supplemental Enhancement Information Messages for Coded Video Bitstreams* (VSEI), as well as related technical reports, software and conformance packages, was as follows:

* Opening remarks and review of meeting logistics and communication practices
* Roll call of participants
* Approval of the agenda
* Code of conduct policy reminder
* IPR policy reminder and declarations
* Contribution document allocation
* Review of results of the previous meeting
* Review of target dates
* Reports of ad hoc group (AHG) activities
* Report of exploration experiment on neural-network-based video coding (EE1)
* Report of exploration experiment on enhanced compression beyond VVC capability (EE2)
* Consideration of contributions on high-level syntax
* Consideration of contributions and communications on project guidance
* Consideration of video coding technology contributions
* Consideration of contributions on conformance and reference software development
* Consideration of contributions on software development in exploration activities
* Consideration of contributions on coding-independent code points for video signal type identification
* Consideration of contributions on film grain synthesis technology
* Consideration of contributions on gaming content compression
* Consideration of contributions on generative face video compression
* Consideration of contributions on optimization of encoders and receiving systems for machine analysis of coded video content
* Consideration of contributions on testing video coding technology beyond common testing conditions, assessment of implementation complexity of video coding technology, and preparation of a call for evidence towards future video coding standardization
* Consideration of contributions on aspects of ultra-low latency and packet loss resilience in the context of video compression
* Consideration of contributions on errata relating to standards in the domain of JVET
* Consideration of contributions on technical reports relating to standards and exploration study activities in the domain of JVET
* Consideration of contributions providing non-normative guidance relating to standards and exploration study activities in the domain of JVET
* Consideration of information contributions
* Consideration of future work items
* Coordination of visual quality testing
* Liaisons, coordination activities with other organizations
* Review of project editor and liaison assignments
* Approval of output documents and associated editing periods
* Future planning: Determination of next steps, discussion of working methods, communication practices, establishment of coordinated experiments (if any), establishment of AHGs, future meeting planning, other planning issues
* Other business as appropriate for consideration
* Closing

The agenda was approved as suggested.

The times of meeting sessions followed the needs of the face-to-face meeting, with highest priority given to the aim of achieving the goals of the meeting. Typical meeting hours were expected to be 0900-2000. KST with coffee breaks and lunch breaks as appropriate, however some early morning or late-night sessions were anticipated to be necessary. Sessions were announced in the online JVET calendar in advance as far as possible, but it was agreed that some activities (such as breakout sessions) could be held at short notice.

## ISO and IEC Code of Conduct reminders

Participants were reminded of the ISO and IEC Codes of Conduct, found at

<https://www.iso.org/publication/PUB100011.html>.

<https://www.iec.ch/basecamp/iec-code-conduct-technical-work>

These include points relating to:

* Behave ethically
* Promote and enable all voices to be heard
* Engage constructively in ISO and IEC activities
* Respect others (in meetings, when writing, on social media)
* Declare actual and potential conflicts of interest and manage them appropriately
* Protect confidential information
* Protect ISO and IEC assets
* Avoid and prevent any form of bribery or corruption
* Uphold the consensus process
* When disputes arise, escalate, resolve and uphold agreed resolution

Participants were also reminded of the UN Codes of Conduct, applying to work under ITU-T, found at <https://www.un.org/management/sites/www.un.org.management/files/un-system-model-code-conduct.pdf>

## IPR policy reminder

Participants were reminded of the IPR policy established by the parent organizations of the JVET and were referred to the parent body websites for further information. The IPR policy was summarized for the participants.

The ITU-T/ITU-R/ISO/IEC common patent policy shall apply. Participants were particularly reminded that contributions proposing normative technical content shall contain a non-binding informal notice of whether the submitter may have patent rights that would be necessary for implementation of the resulting standard. The notice shall indicate the category of anticipated licensing terms according to the ITU-T/ITU-R/ISO/IEC patent statement and licensing declaration form.

This obligation is supplemental to, and does not replace, any existing obligations of parties to submit formal IPR declarations to ITU-T/ITU-R/ISO/IEC.

Participants were also reminded of the need to formally report patent rights to the top-level parent bodies (using the common reporting form found on the database listed below) and to make verbal and/or document IPR reports within the JVET necessary in the event that they are aware of unreported patents that are essential to implementation of a standard or of a draft standard under development.

Some relevant links for organizational and IPR policy information are provided below:

* <http://www.itu.int/ITU-T/ipr/index.html> (common patent policy for ITU-T, ITU-R, ISO, and IEC, and guidelines and forms for formal reporting to the parent bodies)
* <http://ftp3.itu.int/av-arch/jvet-site> (JVET contribution templates)
* <http://www.itu.int/ITU-T/dbase/patent/index.html> (ITU-T IPR database)

The responsible coordinators invited participants to make any necessary verbal reports of previously-unreported IPR in technology that might be considered as prospective candidate for inclusion in future standards, and opened the floor for such reports: No such verbal reports were made.

## Software copyright disclaimer header reminder

It was noted that the VTM and ECM software implementation packages use the same software copyright license header as the HEVC reference software, where the latter had been agreed at the 5th meeting of the JCT-VC and approved by both parent bodies at their collocated meetings at that time. This license header language is based on the BSD license with a preceding sentence declaring that other contributor or third party rights, including patent rights, are not granted by the license, as recorded in [N 10791](https://dms.mpeg.expert/doc_end_user/documents/89_London/wg11/w10791.zip) of the 89th meeting of ISO/IEC JTC 1/‌SC 29/‌WG 11 of June/July 2009. Both ITU and ISO/IEC will be identified in the <OWNER> and <ORGANIZATION> tags in the header. This software header is also used in the process of designing the VTM and ECM software, and for evaluating proposals for technology to be potentially included in these designs. This software or parts thereof might be published by ITU-T and ISO/IEC as an example implementation of a future video coding standard and for use as the basis of products to promote adoption of such technology.

Different copyright statements shall not be committed to the committee software repository (in the absence of subsequent review and approval of any such actions). As noted previously, it must be further understood that any initially-adopted such copyright header statement language could further change in response to new information and guidance on the subject in the future.

These considerations apply to the 360Lib video conversion software and HDRTools as well. The SADL and NNVC packages for neural network-based video coding use the same licensing terms.

Software packages that had been developed in prior work of the JVT, the JCT-VC and the JCT-3V have similar considerations and are maintained according to the past practice in that work.

## Communication practices

The documents for the meeting can be found at <https://jvet-experts.org/>. The site contains links for creating a user account for document uploading and for contacting an administrator – e.g., to update the email address associated with an account, and experts were reminded to keep this information up to date. It was reminded to send a notice to the chairs in cases of changes to document titles, authors, etc.

It was noted that also the most recent versions of JCT-VC and JCT-3V documents can be accessed directly via the JVET site. A mirror for JCT-VC, JCT-3V and JVET document access (including all versions with original upload dates) has also been provided via the ITU ftp site, providing a “documents” subfolder in the directory of each respective meeting.

JVET email lists are managed through the site <https://lists.rwth-aachen.de/postorius/lists/jvet.lists.rwth-aachen.de/>, and to send email to the reflector, the email address is jvet@lists.rwth-aachen.de. Only members of the reflector can send email to the list. However, membership of the reflector is not limited to qualified JVET participants.

It was emphasized that reflector subscriptions and email sent to the reflector must use real names when subscribing and sending messages and subscribers must respond to inquiries regarding the nature of their interest in the work. The current number of subscribers on the JVET email list was 1315 (as of 24 June 2025). All discussions (including those on AVC, HEVC, VVC, CICP, etc.) shall be conducted on the JVET reflector rather than any of the old reflectors (including JVT, JCT-VC, and JCT-3V) which are retained for archiving purposes.

It is further emphasized that the document JVET-AJ1012 gives valuable hints about communication practices as well as other IT resources used in JVET, such as software, conformance, and test materials.

## Terminology

* **ACT**: Adaptive colour transform
* **AFF**: Adaptive frame-field
* **AI**: All-intra
* **AIF**: Adaptive interpolation filtering
* **ALF**: Adaptive loop filter
* **AMP**: Asymmetric motion partitioning – a motion prediction partitioning for which the sub-regions of a region are not equal in size (in HEVC, being N/2x2N and 3N/2x2N or 2NxN/2 and 2Nx3N/2 with 2N equal to 16 or 32 for the luma component)
* **AMVP**: Adaptive motion vector prediction
* **AMT or MTS**: Adaptive multi-core transform, or multiple transform selection
* **AMVR**: (Locally) adaptive motion vector resolution
* **APS**: Adaptation parameter set
* **ARC**: Adaptive resolution conversion (synonymous with DRC, and a form of RPR)
* **ARMC**: Adaptive re-ordering of merge candidates
* **ARSS**: Adaptive reference sample smoothing
* **ATM**: AVC-based multiview and 3D test model
* **ATMVP** or “subblock-based temporal merging candidates”: Alternative temporal motion vector prediction
* **AU**: Access unit
* **AUD**: Access unit delimiter
* **AVC**: Advanced video coding – the video coding standard formally published as ITU-T Recommendation H.264 and ISO/IEC 14496-10
* **BA**: Block adaptive
* **BC**: See CPR or IBC
* **BCW**: Biprediction with CU based weighting
* **BD**: Bjøntegaard-delta – a method for measuring percentage bit rate savings at equal PSNR or decibels of PSNR benefit at equal bit rate (e.g., as described in document VCEG-M33 of April 2001)
* **BDOF**: Bi-directional optical flow (formerly known as **BIO**)
* **BDPCM**: Block-wise DPCM
* **BL**: Base layer
* **BMS**: Benchmark set (no longer used), a former preliminary compilation of coding tools on top of VTM, which provide somewhat better compression performance, but are not deemed mature for standardzation
* **BoG**: Break-out group
* **BR**: Bit rate
* **BT**: Binary tree
* **BV**: Block vector (used for intra BC prediction)
* **CABAC**: Context-adaptive binary arithmetic coding
* **CBF**: Coded block flag(s)
* **CC**: May refer to context-coded, common (test) conditions, or cross-component
* **CCALF**: Cross-component ALF
* **CCLM**: Cross-component linear model
* **CCCM**: Cross-component convolutional model
* **CCP**: Cross-component prediction
* **CCSAO**:Cross-component SAO
* **CE**: Core Experiment – a coordinated experiment conducted toward assessment of coding technology
* **CG**: Coefficient group
* **CGS**: Colour gamut scalability (historically, coarse-grained scalability)
* **CIIP**: Combined inter/intra prediction
* **CL-RAS**: Cross-layer random-access skip
* **CPB**: Coded picture buffer
* **CPMV**: Control-point motion vector
* **CPMVP**: Control-point motion vector prediction (used in affine motion model)
* **CPR**: Current-picture referencing, also known as IBC – a technique by which sample values are predicted from other samples in the same picture by means of a displacement vector called a block vector, in a manner conceptually similar to motion-compensated prediction
* **CST**: Chroma separate tree
* **CTC**: Common test conditions
* **CVS**: Coded video sequence
* **DCI**: Decoder capability information
* **DCT**: Discrete cosine transform (sometimes used loosely to refer to other transforms with conceptually similar characteristics)
* **DCTIF**: DCT-derived interpolation filter
* **DF**: Deblocking filter
* **DIMD**: Decoder intra mode derivation
* **DMVR**: Decoder motion vector refinement
* **DoCR**: Disposition of comments report
* **DPB**: Decoded picture buffer
* **DPCM**: Differential pulse-code modulation
* **DPS**: Decoding parameter sets
* **DRC**: Dynamic resolution conversion (synonymous with ARC, and a form of RPR)
* **DT**: Decoding time
* **DQ**: Dependent quantization
* **ECS**: Entropy coding synchronization (typically synonymous with WPP)
* **EMT**: Explicit multiple-core transform
* **EOTF**: Electro-optical transfer function – a function that converts a representation value to a quantity of output light (e.g., light emitted by a display
* **EPB**: Emulation prevention byte (as in the emulation\_prevention\_byte syntax element)
* **ECM**: Enhanced compression model – a software codebase for future video coding exploration
* **ECV**: Extended Colour Volume (up to WCG)
* **EIP**: Extrapolation based intra prediction
* **EL**: Enhancement layer
* **EOS**: End of (coded video) sequence
* **ET**: Encoding time
* **FRUC**: Frame rate up conversion (pattern matched motion vector derivation)
* **GCI**: General constraints information
* **GDR**: Gradual decoding refresh
* **GFV**: Generative face video
* **GLM**: Gradient linear model
* **GOP**: Group of pictures (somewhat ambiguous)
* **GPM**: Geometry partitioning mode
* **GRA**: Gradual random access
* **HBD**: High bit depth
* **HDR**: High dynamic range
* **HEVC**: High Efficiency Video Coding – the video coding standard developed and extended by the JCT-VC, formalized by ITU-T as Rec. ITU-T H.265 and by ISO/IEC as ISO/IEC 23008-2
* **HLS**: High-level syntax
* **HM**: HEVC Test Model – a video coding design containing selected coding tools that conforms to the HEVC standard design (possibly with under-development extensions) – now also used especially in reference to the (non-normative) encoder algorithms (see WD and TM)
* **HMVP**: History based motion vector prediction
* **HOP**: High-complexity operating point for neural network-based filter.
* **HRD**: Hypothetical reference decoder
* **HTM**: HEVC-based multiview and 3D test model (developed by JCT-3V)
* **HyGT**: Hyper-cube Givens transform (a type of NSST)
* **IBC** (also **Intra BC**): Intra block copy, also known as CPR – a technique by which sample values are predicted from other samples in the same picture by means of a displacement vector called a block vector, in a manner conceptually similar to motion-compensated prediction
* **IBDI**: Internal bit-depth increase – a technique by which lower bit-depth (8 bits per sample) source video is encoded using higher bit-depth signal processing, ordinarily including higher bit-depth reference picture storage (ordinarily 12 bits per sample)
* **IBF**: Intra boundary filtering
* **ILP**: Inter-layer prediction (in scalable coding)
* **ILRP**: Inter-layer reference picture
* **IPCM**: Intra pulse-code modulation (similar in spirit to IPCM in AVC and HEVC)
* **IRAP**: Intra random access picture
* **ISP**: Intra subblock partitioning
* **JCCR**: Joint coding of chroma residuals
* **JCT-3V**: Joint collaborative team on 3D video (for AVC and HEVC)
* **JCT-VC**: Joint collaborative team on video coding (for HEVC)
* **JEM**: Joint exploration model – a software codebase previously used for video coding exploration
* **JM**: Joint model – the primary software codebase that has been developed for the AVC standard
* **JSVM**: Joint scalable video model – another software codebase that has been developed for the AVC standard, which includes support for scalable video coding extensions
* **JVET**: Joint video experts team (initially for VVC, later expanded)
* **JVT**: Joint video team (for AVC)
* **KLT**: Karhunen-Loève transform
* **LB** or **LDB**: Low-delay B – the variant of the LD conditions that uses B pictures
* **LD**: Low delay – one of two sets of coding conditions designed to enable interactive real-time communication, with less emphasis on ease of random access (contrast with RA). Typically refers to LB, although also applies to LP
* **LFNST**: Low-frequency non-separable transform
* **LIC**: Local illumination compensation
* **LM**: Linear model
* **LMCS**: Luma mapping with chroma scaling (formerly sometimes called “in-loop reshaping”)
* **LOP**: Low-complexity operating point for neural network-based filter.
* **LP** or **LDP**: Low delay P – the variant of the LD conditions that uses P frames
* **LUT**: Look-up table
* **LTRP**: Long-term reference picture
* **MANE**: Media-aware network element
* **MC**: Motion compensation
* **MCP**: Motion compensated prediction
* **MCTF**: Motion compensated temporal pre-filtering
* **MDNSST**: Mode dependent non-separable secondary transform
* **MIP**: Matrix-based intra prediction
* **MMLM**: Multi-model (cross component) linear mode
* **MMVD**: Merge with MVD
* **MPEG**: Moving picture experts group (an alliance of working groups and advisory groups in ISO/IEC JTC 1/‌SC 29, one of the two parent bodies of the JVET)
* **MPM**: Most probable mode (in intra prediction)
* **MRL**: Multiple reference line intra prediction
* **MV**: Motion vector
* **MVD**: Motion vector difference
* **NAL**: Network abstraction layer
* **NNPF**: Neural network post filter
* **NNVC**: Neural network-based video coding (experimental software package)
* **NSQT**: Non-square quadtree
* **NSPT**: Non-separable primary transform
* **NSST**: Non-separable secondary transform
* **NUH**: NAL unit header
* **NUT**: NAL unit type (as in AVC and HEVC)
* **OBMC**: Overlapped block motion compensation (e.g., as in H.263 Annex F)
* **OETF**: Opto-electronic transfer function – a function that converts to input light (e.g., light input to a camera) to a representation value
* **OLS**: Output layer set
* **OOTF**: Optical-to-optical transfer function – a function that converts input light (e.g. l,ight input to a camera) to output light (e.g., light emitted by a display)
* **ONNX**: Open Neural Network Exchange – a format used to convert code from common neural network software packages into SADL code
* **operation point**: A temporal subset of an OLS
* **PDPC**: Position-dependent (intra) prediction combination
* **PERP**: Padded equirectangular projection (a 360° projection format)
* **PH**: Picture header
* **PHEC**: Padded hybrid equiangular cubemap (a 360° projection format)
* **PMMVD**: Pattern-matched motion vector derivation
* **POC**: Picture order count
* **PoR**: Plan of record
* **PROF**: Prediction refinement with optical flow
* **PPS**: Picture parameter set
* **PTL**: Profile/tier/level combination
* **QM**: Quantization matrix
* **QP**: Quantization parameter (sometimes conflated with quantization step size)
* **QT**: Quadtree
* **RA**: Random access – a set of coding conditions designed to enable relatively-frequent random access points in the coded video data, with less emphasis on minimization of delay (contrast with LD)
* **RADL**: Random-access decodable leading (type of picture)
* **RASL**: Random-access skipped leading (type of picture)
* **R-D**: Rate-distortion
* **RDO**: Rate-distortion optimization
* **RDOQ**: Rate-distortion optimized quantization
* **RDPCM**: Residual DPCM
* **ROI**: Region of interest
* **ROT**: Rotation operation for low-frequency transform coefficients
* **RPL**: Reference picture list
* **RPLM**: Reference picture list modification
* **RPR**: Reference picture resampling (e.g., as in H.263 Annex P), a special case of which is also known as ARC or DRC
* **RPS**: Reference picture set
* **RQT**: Residual quadtree
* **RRU**: Reduced-resolution update (e.g. as in H.263 Annex Q)
* **RVM**: Rate variation measure
* **SADL**: Small adhoc deep learning librar
* **SAO**: Sample-adaptive offset
* **SBT**: Subblock transform
* **SbTMVP**: Subblock based temporal motion vector prediction
* **SCIPU**: Smallest chroma intra prediction unit
* **SD**: Slice data; alternatively, standard-definition
* **SDH**: Sign data hiding
* **SDT**: Signal-dependent transform
* **SE**: Syntax element
* **SEI**: Supplemental enhancement information
* **SH**: Slice header
* **SHM**: Scalable HM
* **SHVC**: Scalable high efficiency video coding
* **SIF**: Switchable (motion) interpolation filter
* **SIMD**: Single instruction, multiple data
* **SMVD**: Symmetric MVD
* **SPO**: SEI processing order
* **SPS**: Sequence parameter set
* **SR**: Super-resolution
* **STMVP**: Spatial-temporal motion vector prediction
* **STRP**: Short-term reference picture
* **STSA**: Step-wise temporal sublayer access
* **TBA/TBD/TBP**: To be announced/determined/presented/public
* **TGM**: Text and graphics with motion – a category of content that primarily contains rendered text and graphics with motion, mixed with a relatively small amount of camera-captured content
* **TIMD**: Template-based intra mode derivation
* **TM**: Template matching
* **TMVP**: Temporal motion vector prediction
* **TS**: Transform skip
* **TSRC**: Transform skip residual coding
* **TT**: Ternary tree
* **UGC**: User-generated content
* **UWP**: Unequal weight prediction
* **VCEG**: Visual coding experts group (ITU-T Q.6/21, the relevant rapporteur group in ITU-T WP3/21, which is one of the two parent bodies of the JVET)
* **VCM**: Video coding for machines
* **VPS**: Video parameter set – a parameter set that describes the overall characteristics of a coded video sequence – conceptually sitting above the SPS in the syntax hierarchy
* **VQA**: Visual quality assessment
* **VT**: Verification testing
* **VTM**: VVC Test Model
* **VUI**: Video usability information
* **VVC**: Versatile Video Coding
* **WCG**: Wide colour gamut
* **WG**: Working group, a group of technical experts (usually used to refer to the WGs of ISO/IEC JTC 1/SC 29).
* **WPP**: Wavefront parallel processing (usually synonymous with ECS)
* Block and unit names in HEVC:
	+ **CTB**: Coding tree block (luma or chroma) – unless the format is monochrome, there are three CTBs per CTU.
	+ **CTU**: Coding tree unit (containing both luma and chroma, synonymous with LCU), with a size of 16x16, 32x32, or 64x64 for the luma component.
	+ **CB**: Coding block (luma or chroma), a luma or chroma block in a CU.
	+ **CU**: Coding unit (containing both luma and chroma), the level at which the prediction mode, such as intra versus inter, is determined in HEVC, with a size of 2Nx2N for 2N equal to 8, 16, 32, or 64 for luma.
	+ **PB**: Prediction block (luma or chroma), a luma or chroma block of a PU, the level at which the prediction information is conveyed or the level at which the prediction process is performed in HEVC.
	+ **PU**: Prediction unit (containing both luma and chroma), the level of the prediction control syntax within a CU, with eight shape possibilities in HEVC:
		- **2Nx2N**: Having the full width and height of the CU.
		- **2NxN (or Nx2N)**: Having two areas that each have the full width and half the height of the CU (or having two areas that each have half the width and the full height of the CU).
		- **NxN**: Having four areas that each have half the width and half the height of the CU, with N equal to 4, 8, 16, or 32 for intra-predicted luma and N equal to 8, 16, or 32 for inter-predicted luma – a case only used when 2N×2N is the minimum CU size.
		- **N/2x2N** paired with **3N/2x2N** or **2NxN/2** paired with **2Nx3N/2**: Having two areas that are different in size – cases referred to as AMP, with 2N equal to 16 or 32 for the luma component.
	+ **TB**: Transform block (luma or chroma), a luma or chroma block of a TU, with a size of 4x4, 8x8, 16x16, or 32x32.
	+ **TU**: Transform unit (containing both luma and chroma), the level of the residual transform (or transform skip or palette coding) segmentation within a CU (which, when using inter prediction in HEVC, may sometimes span across multiple PU regions).
* Block and unit names in VVC:
	+ **CTB**: Coding tree block (luma or chroma) – there are three CTBs per CTU in a P or B slice or in an I slice that uses a single tree, and one CTB per luma CTU and two CTBs per chroma CTU in an I slice that uses separate trees.
	+ **CTU**: Coding tree unit (synonymous with LCU, containing both luma and chroma in a P or B slice or in an I slice that uses a single tree, containing only luma or only chroma in an I slice that uses separate trees), with a size of 16x16, 32x32, 64x64, or 128x128 for the luma component.
	+ **CB**: Coding block, a luma or chroma block in a CU.
	+ **CU**: Coding unit (containing both luma and chroma in P/B slice, containing only luma or chroma in I slice), a leaf node of a QTBT. It’s the level at which the prediction process and residual transform are performed in JEM. A CU can be square or rectangle shape.
	+ **PB**: Prediction block, a luma or chroma block of a PU.
	+ **PU**: Prediction unit, has the same size as a CU in the VVC context.
	+ **TB**: Transform block, a luma or chroma block of a TU.
	+ **TU**: Transform unit, has the same size as a CU in the VVC context.

## Standards, TRs, supplements and technical papers approval and publication status

* MPEG-2 | H.262 (the video coding specification is common text)
	+ ITU-T H.262 V3 was approved in 2012-02; Amd.1 was approved in 2013-03 and was not published separately; it was instead incorporated directly into the V3 text and published 2013-09
	+ ISO/IEC 13818-2:2013 (Ed. 3) FDIS ballot closed 2012-05-08; FDAM 1 ballot closed 2013-04-12 and was not published separately; it was instead incorporated directly into the V3 text and published 2013-10
	+ Conformance testing (not joint with ITU-T)
		- ISO/IEC 13818-4:2004 (Ed. 2) FDIS closed 2004-08-22, published 2004-12-12; it specifies conformance testing for Part 1 (Systems), Part 2 (Video), Part 3 (Audio), and Part 7 (AAC)
		- ISO/IEC 13818-4:2004/Amd 3:2009 Level for 1080@50p/60p conformance testing
		- Cor 1:2007, Cor 2:2009, Cor 3:2012, Cor 4:2011 may also have video relevance
	+ Reference software (not joint with ITU-T)
		- ISO/IEC TR 13818-5:2005 (Ed. 2) FDIS closed 2005-07-24, published 2005-10; it specifies reference software for Part 1 (Systems), Part 2 (Video), Part 3 (Audio), Part 7 (AAC) and Part 11 (IPMP)
* AVC (twin text)
	+ ITU-T H.264 V14 was Consented at 22nd meeting on 2021-04-30 (with annotated regions, shutter interval, and miscellaneous corrections), approved 2021-08-22, published 2021-10-13
	+ ISO/IEC 14496-10:2020 (Ed. 9) FDIS ballot closed 2020-11-27, published 2020-12-15
	+ ISO/IEC 14496-10:2022 (Ed. 10), had been forwarded from DIS directly for publication 2022-01-21 (with annotated regions, shutter interval, and miscellaneous corrections) with an editing period, submitted to ITTF in 2022-05 after consultation with ISO staff on format of graphics files, upgraded to “DIS approved for registration” in ISO Project system 2022-07-04, published 2022-11-07
	+ Preliminary draft text for YCgCo-Re and YCgCo-Ro issued at 26th meeting, second draft including SMPTE ST 2128 IPT-PQ-C2 issued at 28th meeting 2022-10, third draft issued at 29th meeting 2023-01, fourth draft issued at 30th meeting 2023-04, formal project requested and CD of 11th edition issued at 31st meeting 2023-07, DIS issued at 32nd meeting 2023-10, DAM ballot closed 2024-04-15.
		- H.264 V15 Consented 2024-04-26, last call began 2024-07-16, approved 2024-08-13, published 2024-11-13
		- ISO/IEC 14496-10:202x (Ed. 11) FDIS issued at 34th meeting 2024-04, DIS approved for registration as FDIS 2024-09-17, FDIS ballot issued 2025-01-14, FDIS ballot closed 2025-03-23; pending publication
	+ Amendment to support some SEI messages of VSEI v4 requested at 37th meeting 2025-01, registered to work programme 2025-01-25, ready for action to issue ISO/IEC CDAM
	+ Conformance testing (twin text)
		- ITU-T H.264.1 V6 Approved 2016-02-13, published 2016-06-17
		- Various amendments of ISO/IEC 14496-4:2004, including:
			* ISO/IEC 14496-4:2004/AMD 6:2005 Advanced Video Coding conformance
			* ISO/IEC 14496-4:2004/AMD 9:2006 AVC fidelity range extensions conformance
			* ISO/IEC 14496-4:2004/AMD 30:2009 Conformance testing for new profiles for professional applications
			* ISO/IEC 14496-4:2004/AMD 31:2009 Conformance testing for SVC profiles
			* ISO/IEC 14496-4:2004/AMD 38:2010 Conformance testing for Multiview Video Coding
			* ISO/IEC 14496-4:2004/AMD 41:2014 Conformance testing of MVC plus depth extension of AVC
			* ISO/IEC 14496-4:2004/AMD 42:2014 Conformance testing of Multi-Resolution Frame Compatible Stereo Coding extension of AVC
			* ISO/IEC 14496-4:2004/AMD 43:2015 3D-AVC conformance testing
			* ISO/IEC 14496-4:2004/AMD 45:2016 Conformance Testing for the Multi-resolution Frame Compatible Stereo Coding with Depth Maps Extension of AVC
	+ Reference software (twin text)
		- ITU-T H.264.2 V7 Approved 2016-02-13, published 2016-05-30
		- Various amendments of ISO/IEC 14496-5:2001 have been published, including:
			* ISO/IEC 14496-5:2001/AMD 6:2005 Advanced Video Coding (AVC) and High Efficiency Advanced Audio Coding (HE AAC) reference software
			* ISO/IEC 14496-5:2001/AMD 8:2006 AVC fidelity range extensions reference software
			* ISO/IEC 14496-5:2001/AMD 15:2010 Reference software for Multiview Video Coding
			* ISO/IEC 14496-5:2001/AMD 18:2008 Reference software for new profiles for professional applications
			* ISO/IEC 14496-5:2001/AMD 19:2009 Reference software for Scalable Video Coding
			* ISO/IEC 14496-5:2001/AMD 33:2015 Reference software for MVC plus depth extension of AVC
			* ISO/IEC 14496-5:2001/AMD 34:2014 Reference software of the multi-resolution frame compatible stereo coding of AVC
			* ISO/IEC 14496-5:2001/AMD 35:2015 3D-AVC Reference software
			* ISO/IEC 14496-5:2001/AMD 39:2016 Reference software for the Multi-resolution Frame Compatible Stereo Coding with Depth Maps of AVC
			* ISO/IEC 14496-5:2001/AMD 42:2017 Reference software for the alternative depth information SEI message extension of AVC
* HEVC (twin text)
	+ ITU-T H.265 V7 approved 2019-11-29, published 2020-01-10
	+ ISO/IEC 23008-2:2020 (Ed. 4) FDIS ballot closed 2020-07-16, published 2020-08-27
	+ ITU-T H.265 V8 Consented at the 22nd meeting (shutter interval information SEI message and miscellaneous corrections), published 2020-10-13
	+ ISO/IEC 23008-2:2020/AMD 1:2021 (shutter interval information SEI message) published 2021-07-12
	+ ISO/IEC 23008-2:2023 (Ed. 5) began as CDAM 2 High-range levels output of 25th meeting of January 2022, CDAM ballot closed 2022-04-15, conversion to 5th edition with miscellaneous corrections planned at 26th meeting of 2022-04, text submitted for DIS ballot 2022-07-10, DIS ballot closed 2023-01-10, FDIS issued 29th meeting of 2023-01, FDIS ballot opened 2023-08-06, closed 2023-10-02, published 2023-10-30
	+ ITU-T H.265 V9 Consented at 31st meeting 2023-07, approved 2023-09-13, and pre-published 2023-09, published 2023-11-24.
	+ Preliminary draft HEVC text for YCgCo-Re and YCgCo-Ro issued at 26th meeting 2022-04, second draft including SMPTE ST 2128 issued at 28th meeting 2022-10, third draft at 29th meeting 2023-01, fourth draft at 30th meeting 2023-04, formal work item requested and CDAM1 issued 31st meeting 2023-07, DAM issued with new (multiview) profiles and SEI messages at 32nd meeting 2023-10, DAM ballot closed 2024-04-08
		- H.265 V10 Consented 2024-04-26, last call opened 2024-07-01, closed 2024-07-28, approved 2024-07-29, pre-published 2024-08-06, published 2024-10-07
		- ISO/IEC 23008-2:2025 (Ed. 6) FDIS issued from 35th meeting 2024-04, DIS approved for registration as FDIS 2024-10-03, FDIS registered for formal approval 2024-10-13, FDIS ballot issued 2024-12-30, FDIS ballot closed 2025-02-24, published 2025-03-20
	+ Amendment to support additional (multiview) profiles and some SEI messages of VSEI v4, project requested at 36th meeting 2024-11, project registered in ISO/IEC work programme 2025-01-25, CDAM issued at 37th meeting, consulation began 2025-02-01, pending closure of comment period
	+ Conformance testing (twin text)
		- ITU-T H.265.1 V3 approved 2018-10-14, published 2019-01-15
		- ISO/IEC 23008-8:2018 (Ed. 2) Conformance specification for HEVC, published 2018-08-06
		- ISO/IEC 23008-8:2018/AMD 1:2019 Conformance testing for HEVC screen content coding (SCC) extensions and non-intra high throughput profiles, published 2019-10-15
	+ Reference software (twin text)
		- ITU-T H.265.2 V4 approved 2016-12-22, published 2017-04-10
		- ISO/IEC 23008-5:2017 (Ed. 2) Reference software for high efficiency video coding, FDIS issued from 2016-02 meeting, published 2017-03-01
		- ISO/IEC 23008-5:2017/AMD 1:2017 Reference software for screen content coding extensions, FDAM issued from 2017-04 meeting, FDAM ballot opened 2017-08-10, closed 2017-10-07, published 2017-11-09
* VVC (twin text)
	+ ITU-T H.266 V1 approved 2020-08-29, published 2020-11-10
	+ ISO/IEC 23090-3:2021 (Ed. 1) published 2021-02-16
	+ ITU-T H.266 V2 with operation range extensions, Consented 2022-01-28, Last Call began 2022-04-01, Approved 2022-04-29, pre-published 2022-06-06, published 2022-07-12
	+ ISO/IEC 23090-3:2022 (Ed. 2) with operation range extensions, approval at WG level to proceed to FDIS 2022-01-21, FDIS ballot opened 2022-06-29, closed 2022-08-24, published 2022-09-25
	+ ISO/IEC 23090-3:2024 (Ed. 3), initated as (Ed. 2) / Amd.1 New level and systems-related supplemental enhancement information, CDAM 1 issued from 26th meeting, ballot closed 2022-07-14, DAM 1 issued from 27th meeting, ballot closed 2023-01-03, FDIS issued at WG level 2023-07, FDIS ballot opened 2024-05-11, closed 2024-06-26, published 2024-07-17
	+ ITU-T H.266 V3 Consented 2023-07, approved 2023-09-29 and pre-published 2023-09, published 2023-11-29
	+ ISO/IEC 23090-3:2024/CDAM 1 Request & CDAM issued 2024-04, consultation deferred due to meeting timing, updated text issued 2024-07, consultation initiated 2024-09-05, closed 2024-10-31, ready for action to issue ISO/IEC DAM (or DIS)
	+ Conformance testing (twin text)
		- ITU-T H.266.1 V1 Consented 2022-01-28, Last Call began 2022-04-01, Approved 2022-04-29, pre-published 2022-05-17, published 2022-07-12
		- ISO/IEC 23090-15:2022 (Ed. 1) approval at WG level to proceed to FDIS 2022-10-15, upgraded to “DIS approved for registration” in ISO Projects system 2021-10-24, upgraded to “FDIS registered for formal approval” 2022-07-11, FDIS ballot closed 2022-11-04, published 2022-11-24
		- ISO/IEC 23090-15:2024 (Ed. 2) began as Amd.1 Operation range extensions – CDAM 1 issued from 24th meeting 2021-10, DAM 1 issued from 25th meeting 2022-01-21, upgraded to “CD approved for registration as DIS” status in ISO Projects system 2022-05-31, upgraded to “DIS registered” 2022-06-22, DAM ballot closed 2022-11-15, consolidated into FDIS 2nd edition issued as an output of the 29th meeting in January 2023, ballot opened 2024-04-08, closed 2024-06-03, published 2024-07-04.
		- ITU-T H.266.1 V2 Consented 2023-07, approved 2023-09-13 and pre-published 2023-09, published 2023-10-19
		- ISO/IEC 23090-15 (Ed. 3) project requested at 37th meeting, project registered in work programme 2025-01-25, ready for action to issue CD.
	+ Reference software (twin text)
		- ITU-T H.266.2 V1 Consented 2022-01-28, Last Call began 2022-04-01, Approved 2022-04-29, pre-published 2022-05-17, published 2022-07-12
		- ISO/IEC 23090-16:2022 V1 approval at WG level to proceed to FDIS 2022-01-21, upgraded to “DIS approved for registration” status in ISO Projects system 2022-04-21, upgraded to “FDIS registered for formal approval” 2022-04-22, FDIS ballot initiated 2022-07-24, FDIS ballot closed 2022-09-19, published 2022-10-23
		- H.266.2 V2 Consented 2024-04-26, last call opened 2024-05-16, closed 2024-06-12, approved 2024-06-13, pre-published 2024-08-06, published 2024-10-09
		- ISO/IEC 23090-16:202x (Ed. 2) Request & CD issued 2024-04, consultation deferred due to meeting timing, consultation initiated 2024-09-06, closed 2024-11-01, DIS issued at 36th meeting 2024-11, approved for registration as DIS 2024-12-18, DIS registered 2025-01-7, DIS ballot opened 2025-03-09, no action at the current meeting (Roughly corresponding to H.266.2 V2 already approved and published in ITU-T)
* VSEI (twin text)
	+ ITU-T H.274 V1 approved 2020-08-29, published 2020-11-10
	+ ISO/IEC 23002-7:2021 (Ed. 1) published 2021-01-28
	+ ITU-T H.274 V2 Consented 2022-01-28, Last Call began 2022-04-01, Approved 2022-05-22 (after 1 Last Call comment and Additional Review), pre-published 2022-06-17, published 2022-07-25
	+ ISO/IEC 23002-7:2022 (Ed. 2) approval at WG level to proceed to FDIS 2022-01-21, upgraded to “DIS approved for registration” status in ISO Projects system 2022-05-05 and “FDIS registered for formal approval” 2022-05-08, FDIS ballot closed 2022-09-27, published 2022-10-30
	+ ISO/IEC 23002-7:2024 (Ed. 3) began as (2nd Ed.) Amd.1 Request for new edition and CD for additional SEI messages issued at 27th meeting, ballot closed 2022-10-10, DAM registered 2022-11-13, DAM ballot closed 2022-04-06, FDIS 3rd edition issued 2023-07, FDIS ballot began 2024-07-25, closed 2024-09-20, published 2024-10-30
	+ ITU-T H.274 V3 Consent 2023-07, approved 2023-09-29, pre-published 2023-10-11, published 2024-03-12.
	+ ISO/IEC 23002-7:202x (Ed. 4) Request & CDAM 1 issued 2024-04, consultation deferred due to meeting timing, updated text issued 2024-07, CD consultation initiated 2024-09-05, closed 2024-10-31, ready for action to issue ISO/IEC DAM (or DIS)
* CICP (twin text)
	+ ITU-T H.273 V2 (with 4:2:0 sampling alignment and corrections for range of values for sample aspect ratio, ICTCP equations for HLG, and transfer characteristics function for sYCC of IEC 61966-2-1) Consented on 2021-04-30, Last Call closed during the 23rd meeting with approval on 2021-07-14, published 2021-09-24
	+ ISO/IEC 23091-2:2021 (Ed. 2) had been forwarded from DIS directly for publication in 2021-04 and published 2021-10-18
	+ ITU-T H.273 V3 Consent 2023-07, approved 2023-09, not published due to waiting for publication of SMPTE ST 2128.
	+ ITU-T H.273 V4 Consented 2024-04-26, last call opened 2024-06-16, closed 2024-07-13, approved 2024-07-14, pre-published 2024-08-06, published 2024-10-07.
	+ ISO/IEC 23091-2:2025 (Ed. 3) Request for new edition and CD for new edition (including YCgCo-Re and YCoCg-Ro) issued at 27th meeting, ballot closed 2022-10-10, DIS registered 2022-11-13, DIS ballot closed 2023-04-06, preliminary draft text for including SMPTE ST 2128 issued at 28th meeting, incorporated into preliminary FDIS at 30th meeting 2023-04, FDIS issued 2024-04 (after waiting for publication of SMPTE ST 2128, then proceeding), FDIS registered for formal approval 2024-10-24, FDIS ballot issued 2024-12-03, FDIS ballot closed 2025-01-28, published 2025-02-25.
* Conversion and coding practices for HDR/WCG Y′CbCr 4:2:0 video with PQ transfer characteristics (twin text)
	+ ITU-T H-Series Supplement H.Sup15 V1, approved 2017-01-27, published 2017-04-12
	+ ISO/IEC TR 23008-14:2018 (Ed. 1) published 2018-08-06
* Signalling, backward compatibility and display adaptation for HDR/WCG video coding (twin text)
	+ ITU-T H-Series Supplement H.Sup18 V1, approved 2017-10-27, published 2018-01-18
	+ ISO/IEC TR 23008-15:2018 (Ed. 1) published 2018-08
* Usage of video signal type code points (twin text)
	+ ITU-T H-Series Supplement H.Sup19 V3 approved 2021-04-30, published 2021-06-04
	+ ISO/IEC TR 23091-4:2021 (Ed. 3) published 2021-05-23
* Working practices using objective metrics for evaluation of video coding efficiency experiments (twin text)
	+ ITU-T H-Series Supplement HSTP-VID-WPOM V1 approved 2020-07-03, published 2020-11
	+ ISO/IEC TR 23002-8:2021 (Ed. 1) published 2021-05-20
* Film grain synthesis technologies for video applications (twin text)
	+ ISO/IEC TR 23002-9:2024 (Ed. 1) Request for subdivision and WD 1 issued at 25th meeting 2022-01-21, WD 2 issued at 27th meeting, WD 3 issued at 28th meeting, CDTR issued at 29th meeting 2023-01, consultation period ended 2023-07-09, DTR text was issued from the 31st meeting in July 2023, put on hold by ISO staff editors, DTR ballot opened 2024-03-05, closed 2024-04-30, NB comments handled by ISO staff editor in consultation with project editors, published 2024-07-24
	+ ITU-T H-Series Supplement H.Sup21 (ex H.Sup-FGST), Agreement 2025-01-24 by ITU-T SG21, pre-publication 2025-03-26, pending final publication
	+ Edition 2 planned but not yet in formal work programme of ISO/IEC
* Optimization of encoders and receiving systems for machine analysis of coded video content (twin text)
	+ ISO/IEC 23888-3 (Ed. 1) Request for subdivision issued from 33rd JVET meeting 2024-01, CDTR issued from 34th meeting 2024-04, consultation deferred due to meeting timing, updated text issued from 35th meeting 2024-07, consultation further deferred due to meeting timing, further updated text issued from 36th meeting 2024-11, consultation initiated 2025-01-14, consultation period ended 2025-03-11, ready for action to issue DTR
	+ ITU-T provisional name H.Sup-MACVC
* The following freely available standards are published here in ISO/IEC:
<https://standards.iso.org/ittf/PubliclyAvailableStandards/index.html> as of the time of the current meeting (or soon afterwards, as a temporary problem was reported and fixed around 8 May 2025):
	+ ISO/IEC 13818-4:2004 Conformance testing for MPEG-2
	+ ISO/IEC 13818-4:2004/Amd 3:2009 Level for 1080@50p/60p conformance testing
	+ ISO/IEC TR 13818-5:2005 Software simulation for MPEG-2
	+ Various amendments of ISO/IEC 14496-4:2004 Conformance for AVC
	+ Various amendments of ISO/IEC 14496-5:2001 Reference software for AVC
	+ ISO/IEC 14496-10:2022 (Ed. 10) AVC
	+ ISO/IEC 23090-16:2022 (Ed. 1) Reference software for VVC
* The following standards that have been intended by JVET to be publicly available were not available at <https://standards.iso.org/ittf/PubliclyAvailableStandards/index.html> as of the time of the current meeting. (These should be checked for previously issued requests for free availability.)
	+ ISO/IEC 23002-7:2024 (Ed. 3) – VSEI, published 2024-10-30 (public availability requested 2023-07)
	+ ISO/IEC 23008-2:2025 (Ed. 6) HEVC, published 2023-10-30 (public availability requested 2024-04)
	+ ISO/IEC 23008-5:2017 (Ed. 2) Reference software for HEVC, published 2017-03-01 (public availability requested 2016-02)
	+ ISO/IEC 23008-5:2017/AMD 1:2017 Reference software for HEVC screen content coding extensions, published 2017-11-09 (not requested 2017-01, 2017-04, 2017-07, 2017-10, 2018-01)
	+ ISO/IEC 23008-8:2018 (Ed. 2) Conformance specification for HEVC, published 2018-08-06 (public availability requested 2018-10)
	+ ISO/IEC 23008-8:2018/AMD 1:2019 Conformance testing for HEVC screen content coding (SCC) extensions and non-intra high throughput profiles, published 2019-10-15
	+ ISO/IEC 23090-3:2024 (Ed. 3) VVC, published 2024-07-17
	+ ISO/IEC 23090-15:2024 (Ed. 2) Conformance specification for VVC, published 2024-07-04.
	+ ISO/IEC 23091-2:2025 (Ed. 3) CICP, published 2025-02-25 (public availability requested 2024-04)
* The following technical reports by JVET may not have been requested to be publicly available due to a former policy interpretation by ITTF that has since been changed. (These should be checked for previously issued requests for free availability.)
	+ ISO/IEC TR 23008-14:2018 (Ed. 1) Conversion and coding practices for HDR/WCG Y′CbCr 4:2:0 video with PQ transfer characteristics, published 2018-08-06
	+ ISO/IEC TR 23008-15:2018 (Ed. 1) Signalling, backward compatibility and display adaptation for HDR/WCG video coding, published 2018-08
	+ ISO/IEC TR 23091-4:2021 (Ed. 3) Usage of video signal type code points, published 2021-05-23
	+ ISO/IEC TR 23002-8:2021 (Ed. 1) Working practices using objective metrics for evaluation of video coding efficiency experiments, published 2021-05-20
	+ ISO/IEC TR 23002-9:2024 (Ed. 1) Film grain synthesis technologies for video applications, published 2024-07-24 (not requested 2024-04)
* It appears necessary to check if all older software and conformance packages are publicly available – it might be that this was never requested, e.g. for those that were produced by JCT-3V. This topic was left TBD until the next meeting – perhaps it would be best to compile a list of all relevant software and conformance parts of AVC, HEVC, MPEG-2 aka H.262, CICP, and request these in bulk.

## Draft standards progression status for active work items

* AVC ISO/IEC 14496-10:202x/CDAM 1 to support some SEI messages of VSEI v4 requested at 37th meeting 2025-01, registered to work programme 2025-01-25, ready for action to issue ISO/IEC CDAM
* HEVC ISO/IEC 23008-2:2025/CDAM 1 to support additional (multiview) profiles and some SEI messages of VSEI v4, project requested at 36th meeting 2024-11, project registered in ISO/IEC work programme 2025-01-25, CDAM issued at 37th meeting, consulation began 2025-02-01, pending closure of comment period
* VVC ISO/IEC 23090-3:2024/CDAM 1, Request & CDAM issued 2024-04, consultation deferred due to meeting timing, updated text issued 2024-07, consultation initiated 2024-09-05, closed 2024-10-31, ready for action to issue ISO/IEC DAM (or DIS)
* VVC conformance ISO/IEC 23090-15 (Ed. 3) project requested at 37th meeting, project registered in work programme 2025-01-25, ready for action to issue CD.
* VVC reference software ISO/IEC 23090-16:202x (Ed. 2) Request & CD issued 2024-04, consultation deferred due to meeting timing, consultation initiated 2024-09-06, closed 2024-11-01, DIS issued at 36th meeting 2024-11, approved for registration as DIS 2024-12-18, DIS registered 2025-01-7, DIS ballot opened 2025-03-09, no action at the current meeting. (Roughly corresponding to H.266.2 V2 already approved and published in ITU-T.)
* VSEI ISO/IEC 23002-7:202x (Ed. 3) / CDAM 1 Request & CDAM issued 2024-04, consultation deferred due to meeting timing, updated text issued 2024-07, CD consultation initiated 2024-09-05, closed 2024-10-31, ready for action to issue ISO/IEC DAM (or DIS)
* Film grain synthesis technology for video applications – Edition 2 planned but not yet in formal work programme of ISO/IEC
* Optimization of encoders and receiving systems for machine analysis of coded video content – ISO/IEC 23888-3 Request for subdivision issued from 33rd JVET meeting 2024-01, CDTR issued from 34th meeting 2024-04, consultation deferred due to meeting timing, updated text issued from 35th meeting 2024-07, consultation further deferred due to meeting timing, further updated text issued from 36th meeting 2024-11, consultation initiated 2025-01-14, consultation period ended 2025-03-11, ready for action to issue DTR. ITU-T provisional name H.Sup-MACVC.
* A request for free availability in ISO/IEC has to be made for each edition, amendment and corrigendum, and the request needs to be approved in the WG 5 Recommendations. A request form also needs to be filled out (but the form does not need to be issued as a WG 5 document). A freely available URL for the ITU publication should be provided for the ongoing work items when they become finalized.

## Opening remarks

Remarks during the opening session of the meeting Thursday 26 June at XXXX-XXXX KST were as follows.

* Timing and organization of the meeting and online access and calendar posting of session plans were reviewed
	+ The initial number of documents was slightly lower than for last meeting (approximately 200 vs. 215 by the time of opening the meeting) – parallel sessions were announced to be necessary.
	+ Start of parallel sessions (HLS) Thursday afternoon?
	+ JVET will not meet during the MPEG information exchange sessions on Monday 30 June (0900-1200 KST), Wednesday 2 July (0900-1000 KST), and Friday 4 July (1400-1600 KST). The closing session (with final approval of WG 5 recommendation) is scheduled later on Friday.
* Plans for subsequent hybrid meetings (with best-effort remote access) were reviewed: Oct. 2025 (Geneva), April 2026 (Santa Eulària), June/July 2026 (Geneva), October 2026 (Hangzhou), and likely January 2027 (Australia).
* The January 2026 meeting is currently planned to be virtual.
* Depending on the status of preparing future standardization activities, it may be necessary to extend the duration of meetings, or plan for AHG meeting days prior to the regular meeting (e.g., for analysis of CfE/CfP submissions)
* Significant workload was expected at this meeting for AHG17 activities – to make a step forward in the Call for Evidence. Before start discussion, the viewing for dry-run of CfE test cases needs to be conducted (Friday afternoon, whole day Saturday). During the last AHG telco, it was suggested to have no discussion of low-level tools (EE, etc.) during the viewing – up to 144 volunteers are needed for viewing sessions. Joint meetings with parent bodies are also expected next week.
* The meeting logistics, agenda, working practices, policies, and document allocation considerations were reviewed.
	+ Access to the meeting was provided using Zoom. The meeting notes by the session chair were to be continually shared via zoom screen sharing. In the meeting room C, it is also possible to show them on a separate projection screen in parallel with another presentation.
	+ Having text and software available is crucial (and not just arriving at the end of the meeting).
* The results of the previous meeting and the meeting report JVET-AL1000 were reviewed (which was finalized only shortly before the meeting, but sufficiently mature drafts had been available in the ITU ftp site). Only minor issues in the meeting report were noted and were not considered sufficient to warrant issuing a revision.
* At the current meeting, on-site attendance was recorded via the traditional sign-in sheet. Participants were asked to correct their affiliation and email in case these changed. In the previous meeting, a few cases were found (mostly for those mentioned in the previous bullet point) where the affiliation was outdated. Remote attendance (of those not present in person) will be recorded via the zoom records. It is therefore important to follow the conventions of naming as mentioned before. Participants who cannot be correctly identified will not appear in the attendance sheet.
* There were no objections voiced in the opening plenary to the consideration of late contributions.
* There were again a few documents registered where authors’ given names were not abbreviated according to the JVET custom (which helps produce shorter headings in the JVET meeting report), and/or company affiliation was missing in the authors’ list. Participants were reminded to stick to JVET’s conventions. As for now, the JVET chair took action of correcting those cases in the document registry.
* Experts were asked not to pick a specific JVET number for regular documents – this function is reserved for AHG reports, summary reports, and output docs. Reserving numbers without filling a precise title shall also be avoided – the chair may flag such documents as withdrawn, as they cannot be allocated to a certain category in the meeting notes.
* Experts were asked to always register JVET documents via the “jvet-experts.org” site, not via the MPEG DMS site, as WG 5 docs (as that feature of the DMS site has not been working properly).
* Experts were asked to inform the chair when the title of a document is changed, or if authors are added. Otherwise, that might not be correct in the meeting notes. Provisional titles such as “EEx contribution” shall be avoided.
* Still, only the newest versions of the JCT-VC and JCT-3V documents are available from the links in the JVET site, but a second source for JVET, JCT-VC and JCT-3V documents was set up in the ITU ftp directories of each meeting. This includes all versions of documents with original upload times. JVET documents can only be made available with a delay of at least one meeting cycle, as often newer versions (in particular of output documents) are still uploaded later
* The following ballot results had become available through the SC 29 secretariat:
	+ CDAM AVC [m73164](https://dms.mpeg.expert/doc_end_user/current_document.php?id=99765&id_meeting=203)
	+ DIS on VVC software 2nd ed. [m73167](https://dms.mpeg.expert/doc_end_user/current_document.php?id=99768&id_meeting=203)
	+ FDIS 11th ed. [m73178](https://dms.mpeg.expert/doc_end_user/current_document.php?id=99779&id_meeting=203)
	+ CD on VVC conformance 3rd ed. XXXX
* DAMs for HEVC, VVC and VSEI, as well as the DTR on machine optimization are currently under ballot in ISO/IEC, ballot results should be available prior to the October meeting, such that the final versions could be issued (when also submission of new editions for ITU consent is planned).
* It is planned to produce DAM on AVC and DIS on VVC conformance?. In October, submission of new editions for ITU consent is planned, whereas the ISO/IEC versions could only be issued in January or April next year (depending on editing period).
* The DIS of VVC software is currently matching the ITU edition that was issued in April. FDIS could be issued, starting work towards an amendment or a next edition could be targeted for October, considering the implementation maturity of new SEI messages. Alternatively, another ITU edition could be issued then, and the FDIS aligned with that.
* The primary goals of the meeting were:
	+ AVC DAM text for ISO/IEC ballot
	+ VVC conformance and software for ISO/IEC ballot?
	+ Various aspects of SEI in AVC, HEVC, VVC/VSEI, and TuC
	+ New software versions VTM/HM/JM – support for SEI messages?
	+ Lot of activity in AHG17 – final CfE as output appears possible
	+ Exploration Experiments
		- Neural network-based video coding
		- Enhanced compression beyond VVC
	+ Liaison communication?
	+ VSEI and VVC white papers
* Joint meetings were expected with MPEG AG 5 (on matters involving visual quality assessment), and with MPEG WG 2 Requirements and ITU-T VCEG on future video standardization (see section 7.3).
* As a follow-up to communication after previous meeting, parent bodies conducted discussion about future JVET management structures. It is likely that a subgroup structure will be introduced (which would allow more consistent parallelism during meetings rather than establishing BoGs), and JVET will be chaired in the future by two persons again. Both aspects are consistent with the JVET terms of reference.
* Principles of standards development were discussed.
* Scheduling of sessions was discussed – see under sections 2.6 and 2.12.

## Scheduling of discussions

The times of the meeting sessions followed the needs of the onsite meeting arrangements, with highest priority given to the aim of achieving the goals of the meeting. Typical meeting hours were in the range of 0900-2000 KST with coffee breaks and lunch breaks as appropriate, however some early morning or late-night sessions were noted to potentially be necessary. Sessions were announced in the JVET calendar as far as possible in advance, although it was acknowledged that some activities (such as breakout sessions) might be held at short notice.

Particular scheduling notes are shown below, although not necessarily 100% accurate or complete. Times are recorded in the local timezone of the meeting venue, except as otherwise noted:

Coffee breaks were regularly scheduled at XXXX and XXXX.

* Thu. 26 June, 1st day
	+ Morning sessions:
		- 0900–XXXX Opening remarks, review of practices, agenda, IPR policy reminder
		- XXXX–XXXX Reports of AHGs 1-X
	+ Afternoon sessions:
		- 1400–XXXX Reports of AHGs Y-Z
		- XXXX–XXXX CfE dry-run planning
		- XXXX–XXXX Review of EEX summary
* Fri. 27 June, 2nd day
	+ Morning sessions:
		- XXXX–XXXX Review of EEX summary
		- …
	+ Afternoon sessions:
		- 1400–2000 Viewing for CfE dry-run (no low-level tool discussion in parallel)
		- …
* Sat. 28 June, 3rd day
	+ Morning sessions:
		- 0800–1400 Viewing for CfE dry-run (no low-level tool discussion in parallel)
		- …
	+ Afternoon sessions:
		- 1400–2000 Viewing for CfE dry-run (no low-level tool discussion in parallel)
		- .,.
* Sun. 29 June, 4th day
	+ Morning sessions:
		- …
	+ Afternoon sessions:
		- .,.
* Mon. 30 June, 5th day
	+ 0900–1200 MPEG information sharing session
	+ Morning session
		- 1200–XXXX JVET plenary: …
	+ Afternoon sessions:
		- …
* Tue 1 July, 6th day
	+ Morning sessions:
		- …
	+ Afternoon sessions:
		- .,.
* Wed. 2 July, 7th day
	+ 0900–1000 MPEG information sharing session
	+ Morning sessions:
		- …
	+ Afternoon sessions:
		- …
* Thu. 3 July, 8th day
	+ Morning sessions:
		- …
	+ Afternoon sessions:
		- …
		- JVET plenary: Remaining doc review, revisits, output doc planning, AHG planning
* Fri. 04 July, 9th day
	+ XXXX–XXXX JVET wrap-up plenary:
		- EE review
		- CfE planning
		- Establishment of AHGs
		- Approval of output docs
		- Review of WG 5 meeting recommendations
		- Software timeline
		- Future planning, a.o.b.
	+ 1400–XXXX MPEG information sharing session
	+ XXXX–XXXX WG 5 approval of meeting recommendations, closing of meeting

## Contribution topic overview

The approximate subject categories and quantity of contributions per category for the meeting were summarized as follows (note that the noted document counts do not include crosschecks and summary reports, and may not be completely accurate; documents which are allocated to multiple sections are only counted in one of them):

* AHG reports (18) (section 3)
* Project development (section 4)
	+ AHG1: Development, deployment and advertisement of standards (0)
	+ AHG2: Text development and errata reporting (0)
	+ AHG3: Software development (1)
	+ AHG3: Test conditions (3)
	+ AHG4: Subjective quality testing and verification testing (1)
	+ AHG4: Test and training material (0)
	+ AHG5: Conformance test development (0)
	+ AHG7: ECM tool assessment (6)
	+ AHG8: Optimization of encoders and receiving systems for machine analysis of coded video content (0)
	+ AHG10: Encoding algorithm optimization (0)
	+ AHG13: Film grain synthesis (1)
	+ Implementation studies (3)
	+ Profile/tier/level specification (0)
	+ AHG15: Gaming content compression (0)
	+ AHG16: Generative face video (1)
	+ AHG17: CfE preparation (12)
	+ AHG18: Ultra-low latency and error resilience (11)
	+ CICP (1)
* Low-level tool technology proposals (section 5) with subtopics (number counts excluding BoG and summary reports)
	+ AHG11/AHG14 and EE1: Neural network-based video coding (25) (section 5.1)
	+ AHG6/AHG12 and EE2: Enhanced compression beyond VVC capability (67) (section 5.2)
* AHG9: High-level syntax (HLS) proposals (section 6) with subtopics
	+ Aspects of SEI messages un VSEI, VVC, HEVC and AVC (4) (section 6.1)
	+ Aspects of SEI messages in VSEI v4 (24) (section 6.2)
	+ Extensions of SEI messages in VSEI (2) (section 6.3)
	+ SEI messages in TuC for VSEI (30) (section 6.4)
	+ SEI messages on other topics (6) (section 6.5)
	+ SEI software and showcases (3) (section 6.6)
* Joint meetings, plenary discussions, BoG reports (X) liaison (X), summary of actions (section 7)
* Project planning (section 8)
* Establishment of AHGs (section 9)
* Output documents (section 10)
* Future meeting plans and concluding remarks (section 11)

The document counts above do not include cross-checks and summary reports.

# AHG reports (18)

These reports were discussed during XXXX–XXXX on Thursday 26 June 2025 (chaired by JRO).

[JVET-AM0001](https://jvet-experts.org/doc_end_user/current_document.php?id=15895) JVET AHG report: Project Management (AHG1) [J.-R. Ohm (chair), G. J. Sullivan (vice chair)]

[JVET-AM0002](https://jvet-experts.org/doc_end_user/current_document.php?id=15896) JVET AHG report: Draft text and test model algorithm description editing (AHG2) [B. Bross, C. Rosewarne (co-chairs), F. Bossen, A. Browne, S. Kim, S. Liu, J.-R. Ohm, G. J. Sullivan, A. Tourapis, Y.-K. Wang, Y. Ye (vice chairs)]

[JVET-AM0003](https://jvet-experts.org/doc_end_user/current_document.php?id=15897) JVET AHG report: Test model software development (AHG3) [F. Bossen, X. Li, K. Sühring (co-chairs), E. François, Y. He, K. Sharman, V. Seregin, A. Tourapis (vice chairs)]

[JVET-AM0004](https://jvet-experts.org/doc_end_user/current_document.php?id=15898) JVET AHG report: Test material and visual assessment (AHG4) [V. Baroncini, T. Suzuki, M. Wien (co-chairs), W. Husak, S. Iwamura, P. de Lagrange, S. Liu, X. Meng, S. Puri, A. Segall, S. Wenger (vice-chairs)]

[JVET-AM0005](https://jvet-experts.org/doc_end_user/current_document.php?id=15899) JVET AHG report: Conformance testing (AHG5) I. Moccagatta (chair), [F. Bossen, T. Ikai, S. Iwamura, H.-J. Jhu, K. Kawamura, P. de Lagrange, S. Paluri, K. Sühring, Y. Yu (vice chairs)]

[JVET-AM0006](https://jvet-experts.org/doc_end_user/current_document.php?id=15900) JVET AHG report: ECM software development (AHG6) [V. Seregin (chair), J. Chen, R. Chernyak, F. Le Léannec, K. Zhang (vice-chairs)]

[JVET-AM0007](https://jvet-experts.org/doc_end_user/current_document.php?id=15901) JVET AHG report: ECM tool assessment (AHG7) [X. Li (chair), L.-F. Chen, Z. Deng, J. Gan, E. François, R. Ishimoto, H.-J. Jhu, J. Lainema, X. Li, J. Pardo, A. Stein, H. Wang (vice chairs)]

[JVET-AM0008](https://jvet-experts.org/doc_end_user/current_document.php?id=15902) JVET AHG report: Optimization of encoders and receiving systems for machine analysis of coded video content (AHG8) [S. Liu, J. Ström, S. Wang, M. Zhou (AHG chairs)]

[JVET-AM0009](https://jvet-experts.org/doc_end_user/current_document.php?id=15903) JVET AHG report: SEI message studies (AHG9) [S. McCarthy, J. Boyce, Y.-K. Wang (co-chairs), T. Chujoh, S. Deshpande, M. M. Hannuksela, P. de Lagrange, G. J. Sullivan, H. Tan, A. Tourapis, S. Wenger, P. Wu (vice-chairs)]

[JVET-AM0010](https://jvet-experts.org/doc_end_user/current_document.php?id=15904) JVET AHG report: Encoding algorithm optimization (AHG10) [K. Andersson, P. de Lagrange, A. Duenas (co-chairs), T. Ikai, T. Solovyev, A. Tourapis (vice chairs)]

[JVET-AM0011](https://jvet-experts.org/doc_end_user/current_document.php?id=15905) JVET AHG report: Neural network-based video coding (AHG11) [E. Alshina, F. Galpin, S. Liu, A. Segall (co-chairs), J. Li, Y. Li, R.-L. Liao, M. Santamaria, T. Shao, M. Wien, P. Wu (vice chairs)]

[JVET-AM0012](https://jvet-experts.org/doc_end_user/current_document.php?id=15906) JVET AHG report: Enhanced compression beyond VVC capability (AHG12) [M. Karczewicz, Y. Ye, L. Zhang (co-chairs), B. Bross, R. Chernyak, X. Li, K. Naser, Y. Yu (vice-chairs)]

[JVET-AM0013](https://jvet-experts.org/doc_end_user/current_document.php?id=15907) JVET AHG report: Film grain technologies (AHG13) W. Husak, P. de Lagrange (co-chairs), A. Duenas, X. Meng, M. Radosavljević, A. Segall, G. Teniou, A. Tourapis (vice-chairs)]

[JVET-AM0014](https://jvet-experts.org/doc_end_user/current_document.php?id=15908) JVET AHG report: NNVC software development (AHG14) [F. Galpin (chair), R. Chang, Yue Li, Yun Li, M. Santamaria, J. N. Shingala, Z. Xie (vice chairs)]

[JVET-AM0015](https://jvet-experts.org/doc_end_user/current_document.php?id=15909) JVET AHG report: Gaming content compression (AHG15) [S. Puri, J. Sauer (co-chairs), R. Chernyak, A. Duenas, L. Wang, V. Zakharchenko (vice chairs)]

[JVET-AM0016](https://jvet-experts.org/doc_end_user/current_document.php?id=15910) JVET AHG report: Generative face video compression (AHG16) [Y. Ye (chair), H.-B. Teo, Z. Lyu, S. McCarthy, S. Wang (vice chairs)]

[JVET-AM0017](https://jvet-experts.org/doc_end_user/current_document.php?id=15911) JVET AHG report: Testing of video coding technology beyond CTC (AHG17) [J.-R. Ohm, M. Wien (co-chairs), M. Abdoli, E. Alshina, V. Baroncini, J. Chen, R. Chernyak, Z. Deng, P. de Lagrange, L. Li, D. Rusanovskyy (vice chairs)]

[JVET-AM0018](https://jvet-experts.org/doc_end_user/current_document.php?id=15912) JVET AHG report: Ultra-low latency and packet loss resilience (AHG18) [S. Ikonin, S. Wenger, V. Zakharchenko (co-chairs), S. Deshpande, S. Fößel, C. Kim, X. Ma, S. Puri, J. Ström (vice-chairs)]

# Project development (34)

## AHG1: Development, deployment and advertisement of standards (0)

This section is kept as a template for future use.

## AHG2: Text development and errata reporting (0)

This section is kept as a template for future use.

See also 6.1 and 6.2.1.

## AHG3: Software development (1+1)

Contributions in this area were discussed during XXXX–XXXX on XXday XX June 2025 (chaired by XXX).

[JVET-AM0158](https://jvet-experts.org/doc_end_user/current_document.php?id=15805) [AHG3][AHG6] ECM software code quantity progress [T. Ikai (Sharp)]

See also 5.2.5

[JVET-AM0280](https://jvet-experts.org/doc_end_user/current_document.php?id=15947) AHG3: VTM decoder memory print [C. Hollmann, V. Rufitskiy, A. Filippov (TCL)] [late]

## AHG3: Test conditions (3)

Contributions in this area were discussed during XXXX–XXXX on XXday XX June 2025 (chaired by XXX).

[JVET-AM0187](https://jvet-experts.org/doc_end_user/current_document.php?id=15834) On Intra Period of Random Access Test Case for HD and below Content [X. Li (Google), L. Zhang (ByteDance), X. Wang (Kwai), S. Liu (Tencent), A. Duenas (Warner Bros. Discovery), A. Norkin (Netflix), W. Zhang (Disney), Y. Ye (Alibaba), A. Segall (Amazon)]

[JVET-AM0238](https://jvet-experts.org/doc_end_user/current_document.php?id=15885) Suggestions on GOP Size Setting of Random Access Configuration for Live-streaming Applications [Y. Wu, Y. He, K. Zhang, L. Zhang (Bytedance), X. Li (Google), S. Liu (Tencent), W. Zhang (Disney)] [late] [miss]

[JVET-AM0226](https://jvet-experts.org/doc_end_user/current_document.php?id=15873) Separate Luma and Chroma Plane Coding [X. Li (Google)]

## AHG4: Subjective quality testing and verification testing (1)

Contributions in this area were discussed during XXXX–XXXX on XXday XX June 2025 (chaired by XXX).

[JVET-AM0223](https://jvet-experts.org/doc_end_user/current_document.php?id=15870) AHG4: proposed updates for VVC multi-layer verification test plan [P. de Lagrange (InterDigital)]

## AHG4: Test and training material (0)

This section is kept as a template for future use.

## AHG5: Conformance test development (0)

This section is kept as a template for future use.

## AHG7: ECM tool assessment (6)

Contributions in this area were discussed during XXXX–XXXX on XXday XX June 2025 (chaired by XXX).

[JVET-AM0042](https://jvet-experts.org/doc_end_user/current_document.php?id=15689) Report of AHG7 conference call on Assessment Perspectives of Codec/Coding Tools [X. Li]

[JVET-AM0044](https://jvet-experts.org/doc_end_user/current_document.php?id=15691) AHG7: Summary on the Tool Analysis in Earlier Proposals/Reports [X. Li (Google)]

[JVET-AM0134](https://jvet-experts.org/doc_end_user/current_document.php?id=15781) AHG7: ECM tool combination [R. Ishimoto, Z. Fan, T. Chujoh, T. Ikai (Sharp)]

[JVET-AM0221](https://jvet-experts.org/doc_end_user/current_document.php?id=15868) AHG7: TMRL Tool-Off Bug Fix [Z. Xiang, R. Chernyak, B. Wang, S. Liu (Tencent)]

[JVET-AM0227](https://jvet-experts.org/doc_end_user/current_document.php?id=15874) AhG7: On bin to bit ratio in ECM [T. N. Canh, P. Yin, S. McCarthy (Dolby), J. N. Shingala (Ittiam)] [late]

[JVET-AM0295](https://jvet-experts.org/doc_end_user/current_document.php?id=15963) [AHG7] External memory bandwidth evaluation [Y. Kim, L. Li, M. W. Park, M. Park, M. Budagavi, K. P. Choi (Samsung)] [late]

## AHG8: Optimization of encoders and receiving systems for machine analysis of coded video content (0)

This section is kept as a template for future use.

## AHG10: Encoding algorithm optimization (0)

This section is kept as a template for future use.

## AHG13: Film grain synthesis (1+4)

Contributions in this area were discussed during XXXX–XXXX on XXday XX June 2025 (chaired by XXX).

[JVET-AM0085](https://jvet-experts.org/doc_end_user/current_document.php?id=15732) AHG9/AHG13: On Film Grain Regions Characteristics SEI message [S. Deshpande, J. Samuelsson-Allendes (Sharp)]

See 6.4.7

[JVET-AM0124](https://jvet-experts.org/doc_end_user/current_document.php?id=15771) [AHG9/AHG13]: On typo fix and interface software contribution to the FGRC SEI message [S. Xie, W. Niu, P. Wu, Y. Gao, C. Huang (ZTE)]

See 6.4.7

[JVET-AM0168](https://jvet-experts.org/doc_end_user/current_document.php?id=15815) [AHG9/AHG13] Implementation in VTM TuC of the film grain regions characteristics SEI message [F. Urban, E. François, P. de Lagrange (InterDigital), G. Teniou (Tencent)]

See 6.4.7

[JVET-AM0230](https://jvet-experts.org/doc_end_user/current_document.php?id=15877) AHG9/AHG13: Reference picture resolution for the FGR SEI message [E. François, P. de Lagrange, F. Urban (InterDigital)]

See 6.4.7

[JVET-AM0288](https://jvet-experts.org/doc_end_user/current_document.php?id=15955) Neural network-based film grain analysis [Z. Ameur, F. Lefevbre, P. De Lagrange, M. Radosavljević (InterDigital)] [late]

## Implementation studies (3)

Contributions in this area were discussed during XXXX–XXXX on XXday XX June 2025 (chaired by XXX).

[JVET-AM0239](https://jvet-experts.org/doc_end_user/current_document.php?id=15886) VVdeC with multi-layer decoding capability [S. Iwamura, S. Nemoto, Y. Kondo, A. Ichigaya (NHK)]

[JVET-AM0242](https://jvet-experts.org/doc_end_user/current_document.php?id=15889) VVC playback on Chromium browser [S. Iwamura, S. Nemoto, Y. Kondo, A. Ichigaya (NHK)] [late] [miss]

[JVET-AM0298](https://jvet-experts.org/doc_end_user/current_document.php?id=15966) Ultra-low latency demo: Ressource constraint VVC and HEVC software encoding up to 4K [M. Alvarez Mesa, B. Bross (HHI), C. C. Chi (Spin Digital Labs)] [late] [miss]

## Profile/tier/level specification (0)

This section is kept as a template for future use.

## AHG15: Gaming content compression (0+1)

Contributions in this area were discussed during XXXX–XXXX on XXday XX June 2025 (chaired by XXX).

[JVET-AM0142](https://jvet-experts.org/doc_end_user/current_document.php?id=15789) AHG15: Analysis of Test Sequences for Game Content in the CfE Document [X. Liang, K. Choi (KHU), C. W. Ryu (Kaon Group)]

See also 4.16

## AHG16: Generative face video (1)

Contributions in this area were discussed during XXXX–XXXX on XXday XX June 2025 (chaired by XXX).

Also refer to section 6.1.4.

[JVET-AM0058](https://jvet-experts.org/doc_end_user/current_document.php?id=15705) AHG16: Lightweight Multi-resolution CFTE Model and Color Calibration Post-processing Algorithm for Generative Face Video Compression [Z. Zhang, S. Yin, S. Wang (CityUHK), B. Chen, R.-L. Liao, J. Chen, Y. Ye (Alibaba)]

## AHG17: CfE preparation (12)

Contributions in this area were discussed during XXXX–XXXX on XXday XX June 2025 (chaired by XXX).

Some aspects discussed under section 4.4 could also be relevant here.

[JVET-AM0041](https://jvet-experts.org/doc_end_user/current_document.php?id=15688) AHG17: AhG meeting notes [M. Wien]

[JVET-AM0045](https://jvet-experts.org/doc_end_user/current_document.php?id=15692) AHG17: Generated VTM anchor bitstreams using LambdaScaleTowardsNextQP [K. Andersson, P. Wennersten (Ericsson)]

[JVET-AM0049](https://jvet-experts.org/doc_end_user/current_document.php?id=15696) [AHG17] Suggested results reporting template for constrained encoder complexity category [E. Alshina, J. Sauer, T. Solovyev, M. Lobo (Huawei)]

[JVET-AM0078](https://jvet-experts.org/doc_end_user/current_document.php?id=15725) AHG17: Suggestion to enable DMVR encoder control for VTM anchor [K. Andersson (Ericsson)]

[JVET-AM0125](https://jvet-experts.org/doc_end_user/current_document.php?id=15772) AHG17: Analysis on encoding time and mode cost test for draft CfE sequences [Y. Tokumo, S. Hong, T. Ikai (Sharp)]

[JVET-AM0142](https://jvet-experts.org/doc_end_user/current_document.php?id=15789) AHG15: Analysis of Test Sequences for Game Content in the CfE Document [X. Liang, K. Choi (KHU), C. W. Ryu (Kaon Group)]

[JVET-AM0194](https://jvet-experts.org/doc_end_user/current_document.php?id=15841) On Analyzing and Reporting Encoding and Decoding Complexity [A. Stein, S. Ferrara (V-Nova)]

[JVET-AM0200](https://jvet-experts.org/doc_end_user/current_document.php?id=15847) AHG17: Getting VTM to run five times faster [F. Bossen]

[JVET-AM0289](https://jvet-experts.org/doc_end_user/current_document.php?id=15956) Cross-check of JVET-AM0200 "AHG17: Getting VTM to run five times faster" [F. Le Léannec (InterDigital)] [late] [miss]

[JVET-AM0225](https://jvet-experts.org/doc_end_user/current_document.php?id=15872) [AHG17] Encoder runtime for the constrained complexity configurations under the CfE draft test conditions [T. Solovyev, J. Sauer, M. A. Lobo, E. Alshina (Huawei)]

[JVET-AM0234](https://jvet-experts.org/doc_end_user/current_document.php?id=15881) [AHG17] Overview of the 3GPP codec testing in TR 26.955 [R. Mekuria, E. Alshina (Huawei), J. Lemotheux (Orange)]

[JVET-AM0237](https://jvet-experts.org/doc_end_user/current_document.php?id=15884) On constrained encoding and decoding experiments [L. Li, M. W. Park, M. Park, Y. Kim, M. Budagavi, K. P. Choi (Samsung)]

[JVET-AM0269](https://jvet-experts.org/doc_end_user/current_document.php?id=15936) AHG17 ECM/VTM performance under CfE requirement [K. Naser, E. François, F. Le Léannec, F. Galpin (InterDigital)] [late]

[JVET-AM0287](https://jvet-experts.org/doc_end_user/current_document.php?id=15954) [AHG17] On HDR coding and metrics [D. Rusanovskyy (Nokia), E. François (InterDigital)] [late]

## AHG18 Ultra-low latency and packet loss resilience (11)

Contributions in this area were discussed during XXXX–XXXX on XXday XX June 2025 (chaired by XXX).

[JVET-AM0046](https://jvet-experts.org/doc_end_user/current_document.php?id=15693) AHG18: Teleconference on ultra-low latency and packet loss resilience [S. Ikonin, S. Wenger, V. Zakharchenko (co-chairs), S. Deshpande, J. Ström, X. Ma, C. Kim, S. Puri, S. Fößel (vice-chairs)]

[JVET-AM0051](https://jvet-experts.org/doc_end_user/current_document.php?id=15698) AHG18: 2nd teleconference on ultra-low latency and packet loss resilience [S. Ikonin, S. Wenger, V. Zakharchenko (co-chairs), S. Deshpande, J. Ström, X. Ma, C. Kim, S. Puri, S. Fößel (vice-chairs)]

[JVET-AM0109](https://jvet-experts.org/doc_end_user/current_document.php?id=15756) AHG18: On Test Conditions for Ultra-Low Latency and Error Resilience [S. Deshpande (Sharp)]

[JVET-AM0188](https://jvet-experts.org/doc_end_user/current_document.php?id=15835) AHG18: An introduction to the next generation media transport protocol – Media over QUIC (MoQ) [W. Ding, X. Ma, S. Ikonin, E. Alshina (Huawei)]

[JVET-AM0195](https://jvet-experts.org/doc_end_user/current_document.php?id=15842) AhG18: Gradual Decoding Refresh (GDR) under ultra low latency test scenario [M. Sychev, A. Dzugaev, S. Ikonin, E. Alshina (Huawei)]

[JVET-AM0198](https://jvet-experts.org/doc_end_user/current_document.php?id=15845) AhG18: Temporal Scalability under ultra low latency test scenario [M. Sychev, K. Malyshev, S. Ikonin, E. Alshina (Huawei)]

[JVET-AM0201](https://jvet-experts.org/doc_end_user/current_document.php?id=15848) AHG18: Overview of 3GPP features for Extended Reality (XR) and related high quality conversational services and related implications for ultra-low latency (ULL) coding [R. Mekuria, Q. Pan, X. Ma, S. Ikonin, E. Alshina (Huawei)]

[JVET-AM0202](https://jvet-experts.org/doc_end_user/current_document.php?id=15849) AhG18: On ultra low latency and packet loss resilience coding tools integration [V. Zakharchenko (Nokia)]

[JVET-AM0203](https://jvet-experts.org/doc_end_user/current_document.php?id=15850) AHG18: Full VTM tool set in ultra-low latency test scenario [V. Khamidullin, I. Gribushin, S. Ikonin, E. Alshina (Huawei)]

[JVET-AM0204](https://jvet-experts.org/doc_end_user/current_document.php?id=15851) AhG18: Multilayer coding with spatial scalability under ultra low latency test scenario [V. Zakharchenko (Nokia)]

[JVET-AM0218](https://jvet-experts.org/doc_end_user/current_document.php?id=15865) AHG18: Solution beyond scalable coding for ultra-low latency and packet loss resilience [S. Ikonin, V. Khamidullin, I. Gribushin, M. Sychev, X. Ma, E. Alshina (Huawei)]

[JVET-AM0222](https://jvet-experts.org/doc_end_user/current_document.php?id=15869) AHG18: On test conditions for ultra-low latency and packet loss resilience [S. Ikonin, I. Gribushin, M. Sychev, E. Alshina (Huawei)]

[JVET-AM0235](https://jvet-experts.org/doc_end_user/current_document.php?id=15882) Implementation of error resilient transmission system for scalable services [S. Iwamura, S. Nemoto, Y. Kondo, A. Ichigaya (NHK)]

## CICP (1)

Contributions in this area were discussed during XXXX–XXXX on XXday XX June 2025 (chaired by XXX).

[JVET-AM0089](https://jvet-experts.org/doc_end_user/current_document.php?id=15736) On CICP TuC for monochrome content [J. Boyce, M. M. Hannuksela (Nokia), A. Tourapis, D. Podborski (Apple)]

# Low-level tool technology proposals (92)

## AHG11/AHG14: Neural network-based video coding (25)

### Summary and BoG reports (2)

Contributions in this area were discussed during XXXX–XXXX on XXday XX June 2025 (chaired by XXX).

[JVET-AM0023](https://jvet-experts.org/doc_end_user/current_document.php?id=15913) EE1: Summary report of exploration experiment on neural network-based video coding [E. Alshina, R. Chang, F. Galpin, Yue Li, Yun Li, M. Santamaria, T. Shao, J. Ström, Z. Xie (EE coordinators)]

[JVET-AM0043](https://jvet-experts.org/doc_end_user/current_document.php?id=15690) [AHG11] [AHG14] Teleconference on NNVC [E. Alshina, F. Galpin]

### EE1 contributions: Neural network-based video coding (8)

Contributions in this area were discussed in the context of the EE summary report JVET-AM0023.

[JVET-AM0053](https://jvet-experts.org/doc_end_user/current_document.php?id=15700) EE1-2.2: Conditional loop-filter [M. Santamaria, F. Cricri, N. Le (Nokia)]

[JVET-AM0114](https://jvet-experts.org/doc_end_user/current_document.php?id=15761) EE1-3.1: RA/LDB Unified Reference Frame Synthesis for VVC Inter Coding [Q. Qin, C. Jung (Xidian Univ.)]

[JVET-AM0282](https://jvet-experts.org/doc_end_user/current_document.php?id=15949) Crosscheck of JVET-AM0114 (EE1-3.1: RA/LDB Unified Reference Frame Synthesis for VVC Inter Coding) [N. Bhaskar (Huawei)] [late] [miss]

[JVET-AM0120](https://jvet-experts.org/doc_end_user/current_document.php?id=15767) EE1-1.2: Over-Parameterized LOP In-Loop Filter [J. Han, C. Jung, Q. Qin (Xidian Univ.)]

[JVET-AM0293](https://jvet-experts.org/doc_end_user/current_document.php?id=15961) Crosscheck of JVET-AM0120 (EE1-1.2: Over-Parameterized LOP In-Loop Filter) [T. Yang, W.-X. He, Y.-Q. Zhu, J.-D. Ye, X.-T. Xie, J.-S. Gong, Q. Liu (HUST), Z.-Y. Lv (vivo)] [late] [miss]

[JVET-AM0122](https://jvet-experts.org/doc_end_user/current_document.php?id=15769) EE1-1.3: Backbone Block Enhancement of LOP In-Loop Filter with Over-Parameterized Training and Variable Channels [J. Han, C. Jung, Q. Qin (Xidian Univ.)]

[JVET-AM0294](https://jvet-experts.org/doc_end_user/current_document.php?id=15962) Crosscheck of JVET-AM0122 (EE1-1.3: Backbone Block Enhancement of LOP In-Loop Filter with Over-Parameterized Training and Variable Channels) [T. Yang, W.-X. He, Y.-Q. Zhu, J.-D. Ye, X.-T. Xie, J.-S. Gong, Q. Liu (HUST), Z. -Y. Lv (vivo)] [late] [miss]

[JVET-AM0123](https://jvet-experts.org/doc_end_user/current_document.php?id=15770) EE1-1.1: Sample-based adaptive blending weight selection for NN-based in-loop filter [H. Kwon, H. Ko (Hanyang Univ.)]

[JVET-AM0135](https://jvet-experts.org/doc_end_user/current_document.php?id=15782) EE1-2.1: Improved VLOP Attention with SIMD acceleration [Y. Li, M. Coban, M. Karczewicz, L. Kerofsky (Qualcomm)]

[JVET-AM0272](https://jvet-experts.org/doc_end_user/current_document.php?id=15939) Crosscheck of JVET-AM0135 (EE1-2.1: Improved VLOP Attention with SIMD acceleration) [M. Santamaria (Nokia)] [late] [miss]

[JVET-AM0175](https://jvet-experts.org/doc_end_user/current_document.php?id=15822) EE1-3.2: Deep Reference Frame Generation for Inter Prediction Enhancement [X. Chen, N. Fu, W. Zhang, J. Zhang, D. Ding, W. Ma, Z. Chen (Wuhan Univ.)]

[JVET-AM0267](https://jvet-experts.org/doc_end_user/current_document.php?id=15934) Crosscheck of JVET-AM0175 (EE1-3.2: Deep Reference Frame Generation for Inter Prediction Enhancement) [N. Bhaskar (Huawei?)] [late] [miss]

[JVET-AM0283](https://jvet-experts.org/doc_end_user/current_document.php?id=15950) crosscheck of JVET-AM0175 (EE1-3.2: Deep Reference Frame Generation for Inter Prediction Enhancement) [Z. Xie (OPPO)] [late] [miss]

[JVET-AM0257](https://jvet-experts.org/doc_end_user/current_document.php?id=15924) EE1-4.1: Cross-component enhanced NNSR [T. Yang, W.-X. He, Y.-Q. Zhu, J.-D. Ye, X.-T. Xie, J.-S. Gong, Q. Liu (HUST), Z.-Y. Lv (vivo)] [late]

[JVET-AM0275](https://jvet-experts.org/doc_end_user/current_document.php?id=15942) Crosscheck of JVET-AM0257 (EE1-4.1: Cross-component enhanced NNSR) [J. Han, C. Jung, Q. Qin (Xidian Univ.)] [late] [miss]

### EE1 related and beyond-EE contributions: Neural network-based video coding (13)

Contributions in this area were discussed during XXXX–XXXX on XXday XX June 2025 (chaired by XXX).

[JVET-AM0050](https://jvet-experts.org/doc_end_user/current_document.php?id=15697) AHG 14: Work on NN-coded Base Layer in VTM / NNVC [F. Brand, T. Solovyev, E. Alshina Huawei)]

[JVET-AM0057](https://jvet-experts.org/doc_end_user/current_document.php?id=15704) AHG11: A Hybrid Framework Integrating End-to-End Learned Image Codec with Conventional Codec [N. Zou, A. Hallapuro, F. Cricri, H. Zhang, A. B. Koyuncu, J. Ahonen, M. M. Hannuksela (Nokia)]

[JVET-AM0115](https://jvet-experts.org/doc_end_user/current_document.php?id=15762) EE1-related: URFS Performance Comparison on NNVC-4.0 and NNVC-9.0 Training Sets [Q. Qin, C. Jung (Xidian Univ.)]

[JVET-AM0116](https://jvet-experts.org/doc_end_user/current_document.php?id=15763) EE1-related: Comparative Analysis of URFS in AJ0099, AK0077, and AL0105 [Q. Qin, C. Jung (Xidian Univ.)]

[JVET-AM0131](https://jvet-experts.org/doc_end_user/current_document.php?id=15778) AHG11: LOP with Overlapped Feature Integration [J. Chi, A. Li, Y. Du, Ce Zhu, L. Luo, H.Guo (UESTC), Y. Huo, Y. Liu (Transsion)]

[JVET-AM0143](https://jvet-experts.org/doc_end_user/current_document.php?id=15790) AHG11: Feature Fusion-Based Post-Filter for Efficient Video Enhancement [T. Das, K. Choi (KHU), B.-S. Kim, I. Cho, S. Hahm (KBS)]

[JVET-AM0144](https://jvet-experts.org/doc_end_user/current_document.php?id=15791) AHG11: GAN-Based Post-Filter for Quality Enhancement of VVC Compressed Video [T. Das, K. Choi (KHU), B.-S. Kim, I. Cho, S. Hahm (KBS)]

[JVET-AM0177](https://jvet-experts.org/doc_end_user/current_document.php?id=15824) AHG11: Deep Reference Frame Generation for Inter Prediction Enhancement with Structural Re-parameterization [W. Zhang, C. Gui, N. Fu, X. Chen, W. Ma, Z. Chen (Wuhan Univ.)]

[JVET-AM0300](https://jvet-experts.org/doc_end_user/current_document.php?id=15968) Crosscheck of JVET-AM0177 (AHG11: Deep Reference Frame Generation for Inter Prediction Enhancement with Structural Re-parameterization) [Y. Wang (Tencent)] [late] [miss]

[JVET-AM0185](https://jvet-experts.org/doc_end_user/current_document.php?id=15832) AhG11: Decomposed Content-Adaptive VLOP [Z. Xu, J. Konieczny, A. Filippov, C. Hollmann, V. Rufitskiy, T. Dong, H. Qin (TCL)]

[JVET-AM0186](https://jvet-experts.org/doc_end_user/current_document.php?id=15833) AhG11: Content-Adaptive Neural Network-based Super Resolution [Z. Xu, J. Konieczny, A. Filippov (TCL)]

[JVET-AM0199](https://jvet-experts.org/doc_end_user/current_document.php?id=15846) AHG11: NNSR with consistent backbone block [H. Cho, S. Bahk, H. Y. Kim (KHU), D. Kim, S.-C. Lim (ETRI)]

[JVET-AM0214](https://jvet-experts.org/doc_end_user/current_document.php?id=15861) AHG 11: Motion Vector Restriction in Multi-Layer Hybrid NN-based and Conventional Coding [F. Brand, T. Solovyev, E. Alshina (Huawei)]

[JVET-AM0224](https://jvet-experts.org/doc_end_user/current_document.php?id=15871) AHG11: Multi-scale LOP backbone blocks with cross-scale interactions [L. Murn, M. Santamaria, F. Cricri (Nokia)]

### SADL and NNVC implementation, CTC (4)

Contributions in this area were discussed during XXXX–XXXX on XXday XX June 2025 (chaired by XXX).

[JVET-AM0073](https://jvet-experts.org/doc_end_user/current_document.php?id=15720) [AHG11] Comparison of execution time of NN on different devices [A. Karabutov, E. Alshina, F. Brand (Huawei)]

[JVET-AM0136](https://jvet-experts.org/doc_end_user/current_document.php?id=15783) AhG14: Improvement of SIMD implementation with expanded SIMD operators in SADL for LOP with Attention [Y. Li, M. Coban, M. Karczewicz (Qualcomm)]

[JVET-AM0170](https://jvet-experts.org/doc_end_user/current_document.php?id=15817) AhG14: SADL update [F. Galpin (InterDigital)] [late]

[JVET-AM0178](https://jvet-experts.org/doc_end_user/current_document.php?id=15825) AHG14: The extension of SADL library [N. Fu, W. Ma, Z. Chen (Wuhan Univ.)]

## AHG6/AHG12: Enhanced compression beyond VVC capability (67)

### Summary and BoG reports (1)

Contributions in this area were discussed during XXXX–XXXX on XXday XX June 2025 (chaired by XXX).

[JVET-AM0024](https://jvet-experts.org/doc_end_user/current_document.php?id=15914) EE2: Summary report of exploration experiment on enhanced compression beyond VVC capability [V. Seregin, D. Bugdayci Sansli, J. Chen, R. Chernyak, K. Naser, J. Ström, F. Wang, M. Winken, X. Xiu, K. Zhang (EE coordinators)]

### EE2 contributions: Enhanced compression beyond VVC capability (25)

There was no presentation or discussion about specific proposals in this category.

For actions decided to be taken, see section 5.2.1, unless otherwise noted.

[JVET-AM0054](https://jvet-experts.org/doc_end_user/current_document.php?id=15701) EE2-3.6cd: On coefficient level binarization in Transform Skip [M. Abdoli, R. G. Youvalari, A. Tissier, F. Plowman (Xiaomi)]

[JVET-AM0251](https://jvet-experts.org/doc_end_user/current_document.php?id=15918) Crosscheck of JVET-AM0054 (EE2-3.6cd: On coefficient level binarization in Transform Skip) [Y. Yu, J. Gan (OPPO)] [late] [miss]

[JVET-AM0056](https://jvet-experts.org/doc_end_user/current_document.php?id=15703) EE2-3.1: Predictive transform coefficient coding [T. N. Canh, F. Pu, P. Yin, S. McCarthy (Dolby)]

[JVET-AM0243](https://jvet-experts.org/doc_end_user/current_document.php?id=15890) Crosscheck of JVET-AM0056 (EE2-3.1: Predictive transform coefficient coding) [P. Nikitin (Qualcomm)] [late] [miss]

[JVET-AM0059](https://jvet-experts.org/doc_end_user/current_document.php?id=15706) EE2-1.10: Matrix-based position dependent intra prediction for GPM/CIIP [Z. Sun, Y. Yu, L. Xu, H. Yu, D. Wang (OPPO)]

[JVET-AM0256](https://jvet-experts.org/doc_end_user/current_document.php?id=15923) Crosscheck of JVET-AM0059 (EE2-1.10: Matrix-based position dependent intra prediction for GPM/CIIP) [X. Li (Alibaba)] [late] [miss]

[JVET-AM0060](https://jvet-experts.org/doc_end_user/current_document.php?id=15707) EE2-3.2: Directional sign prediction [L. Xu, Y. Yu, Z. Sun, L. Zhang, H. Yu, D. Wang (OPPO)]

[JVET-AM0261](https://jvet-experts.org/doc_end_user/current_document.php?id=15928) Crosscheck of JVET-AM0060 (Test EE2-3.2 on directional sign prediction) [P. Onno (Canon)] [late] [miss]

[JVET-AM0061](https://jvet-experts.org/doc_end_user/current_document.php?id=15708) EE2-3.3: Third transform set selection for intraNN [Z. Xie, F. Wang, Y. Yu, H. Yu, D. Wang (OPPO)]

[JVET-AM0266](https://jvet-experts.org/doc_end_user/current_document.php?id=15933) Crosscheck of JVET-AM0061 (EE2-3.3: Third transform set selection for intraNN) [G. Verba (Qualcomm)] [late] [miss]

[JVET-AM0062](https://jvet-experts.org/doc_end_user/current_document.php?id=15709) EE2-3.6ab: On binarization of a coefficient level in TSRC [Y. Yu, L. Xu, J. Gan, H. Yu, D. Wang (OPPO), M. Abdoli, R. G. Youvalari, F. Plowman, A. Tissier (Xiaomi)]

[JVET-AM0245](https://jvet-experts.org/doc_end_user/current_document.php?id=15892) Crosscheck of JVET-AM0062 (EE2-3.6ab: On binarization of a coefficient level in TSRC) [P. Nikitin (Qualcomm)] [late] [miss]

[JVET-AM0252](https://jvet-experts.org/doc_end_user/current_document.php?id=15919) Crosscheck of JVET-AM0062 (EE2-3.6ab: On binarization of a coefficient level in TSRC) [T. N. Canh (Dolby)] [late] [miss]

[JVET-AM0286](https://jvet-experts.org/doc_end_user/current_document.php?id=15953) Crosscheck of JVET-AM0062 (EE2-3.6ab: On binarization of a coefficient level in TSRC) [Z. Deng (Bytedance)] [late] [miss]

[JVET-AM0063](https://jvet-experts.org/doc_end_user/current_document.php?id=15710) EE2-4.3: On ALF-CCCM [N. Song, L. Xu, Y. Yu, H. Yu, D. Wang (OPPO)]

[JVET-AM0276](https://jvet-experts.org/doc_end_user/current_document.php?id=15943) Crosscheck of JVET-AM0063 (EE2-4.3: On ALF-CCCM) [C. Ma (Kwai)] [late] [miss]

[JVET-AM0291](https://jvet-experts.org/doc_end_user/current_document.php?id=15958) Crosscheck of JVET-AM0063 (EE2-4.3: On ALF-CCCM) [N. Hu (Qualcomm)] [late] [miss]

[JVET-AM0074](https://jvet-experts.org/doc_end_user/current_document.php?id=15721) EE2-1.6: Intra Merge Mode [M.Blestel, P. Andrivon, K. Suverov, N. Zouidi (Ofinno), Y. Chang, V. Seregin, M. Karczewicz (Qualcomm Inc.), J. Fu, J. Zhang, S. Ma (Peking University)]

[JVET-AM0290](https://jvet-experts.org/doc_end_user/current_document.php?id=15957) Cross-check of JVET-AM0074 "EE2-1.6: Intra Merge Mode" [F. Le Léannec (InterDigital)] [late] [miss]

[JVET-AM0077](https://jvet-experts.org/doc_end_user/current_document.php?id=15724) EE2-1.1: TIMD fusion with neural network based intra prediction [Y.-H. Lin, C.-Y. Teng, K.-W. Liang, Y.-C. Yang (Sharp), K. Naser, T. Dumas, E. François, F. Le Léannec (InterDigital)]

[JVET-AM0137](https://jvet-experts.org/doc_end_user/current_document.php?id=15784) Crosscheck of JVET-AM0077 (EE2-1.1: TIMD fusion with neural network based intra prediction) [N. Zouidi (Ofinno)]

[JVET-AM0084](https://jvet-experts.org/doc_end_user/current_document.php?id=15731) EE2-1.9: Block Vector-based Intra Mode Derivation [J.-K. Lee, D. Ruiz Coll, M. Blestel (Offinno)] [late]

[JVET-AM0304](https://jvet-experts.org/doc_end_user/current_document.php?id=15972) crosscheck of JVET-AM0084: EE2-1.9: Block Vector-based Intra Mode Derivation [K. Naser (InterDigital)] [late] [miss]

[JVET-AM0088](https://jvet-experts.org/doc_end_user/current_document.php?id=15735) EE2-2.3: Affine bilateral matching mode [H. Huang, V. Seregin, M. Karczewicz (Qualcomm)]

[JVET-AM0106](https://jvet-experts.org/doc_end_user/current_document.php?id=15753) EE2-2.1a/b: Chained candidates in AMVP and merge lists [D. Bugdayci Sansli, J. Lainema (Nokia)]

[JVET-AM0271](https://jvet-experts.org/doc_end_user/current_document.php?id=15938) Crosscheck of JVET-AM0106 (EE2-2.1a/b: Chained candidates in AMVP and merge lists) [Y. Kidani (KDDI)] [late] [miss]

[JVET-AM0133](https://jvet-experts.org/doc_end_user/current_document.php?id=15780) EE2-4.1: TALF with reconstructed samples [C. Ma, X. Xiu, X. Wang (Kwai)]

[JVET-AM0305](https://jvet-experts.org/doc_end_user/current_document.php?id=15973) Crosscheck of JVET-AM0133 (EE2-4.1: TALF with reconstructed samples) [N. Song (OPPO)] [late] [miss]

[JVET-AM0138](https://jvet-experts.org/doc_end_user/current_document.php?id=15785) EE2-1.2a/b/c: TIMD-BV extension with enhanced IntraTMP merge list [J. Fu, J. Zhang, Y. Zhao, S. Ma (PKU), Y. Gao, C. Huang (ZTE), K. Naser, M. Radosavljević, S. Puri, T. Dumas (InterDigital), D. Ruiz Coll, J.-K Lee (Ofinno)]

[JVET-AM0255](https://jvet-experts.org/doc_end_user/current_document.php?id=15922) Crosscheck of JVET-AM0138 (EE2-1.2a/b/c: TIMD-BV extension with enhanced IntraTMP merge list) [X. Li (Alibaba)] [late] [miss]

[JVET-AM0157](https://jvet-experts.org/doc_end_user/current_document.php?id=15804) EE2-1.8: Harmonization of SGPM-BV and LIC [J. Huo, Y. Fei, L. Wang, Y. Ma, F. Yang (Xidian Univ.)]

[JVET-AM0253](https://jvet-experts.org/doc_end_user/current_document.php?id=15920) Crosscheck of JVET-AM0157 (EE2-1.8: Harmonization of SGPM-BV and LIC) [X. Li (Alibaba)] [late] [miss]

[JVET-AM0163](https://jvet-experts.org/doc_end_user/current_document.php?id=15810) EE2-1.7: On interpolation filter for TIMD [Y. Wang, W. Yin, K. Zhang, Z. Deng, N. Zhang, L. Zhao, M. Salehifar, L. Zhang (Bytedance)]

[JVET-AM0236](https://jvet-experts.org/doc_end_user/current_document.php?id=15883) Crosscheck of JVET-AM0163 (EE2-1.7: On interpolation filter for TIMD) [L. Xu, Y. Yu (OPPO)] [late] [miss]

[JVET-AM0172](https://jvet-experts.org/doc_end_user/current_document.php?id=15819) EE2-3.5: a combination of EE2-3.3 and EE2-3.4 [Z. Xie, F. Wang, Y. Yu, H. Yu, D. Wang (OPPO), G. Verba, M. Coban, V. Seregin, M. Karczewicz (Qualcomm)]

[JVET-AM0209](https://jvet-experts.org/doc_end_user/current_document.php?id=15856) EE2-4.2: Reuse of ALF control information [N. Hu, H. Wang, M. Karczewicz, V. Seregin (Qualcomm)]

[JVET-AM0306](https://jvet-experts.org/doc_end_user/current_document.php?id=15974) Crosscheck of JVET-AM0209 (EE2-4.2: Reuse of ALF control information) [N. Song (OPPO)] [late] [miss]

[JVET-AM0215](https://jvet-experts.org/doc_end_user/current_document.php?id=15862) EE2-2.2: Regression-based GPM intra-inter prediction modification [R. Yu, V. Seregin, M. Karczewicz (Qualcomm)]

[JVET-AM0258](https://jvet-experts.org/doc_end_user/current_document.php?id=15925) Crosscheck of JVET-AM0215 (EE2-2.2: Regression-based GPM intra-inter prediction modification) [K. Jia (Alibaba)] [late] [miss]

[JVET-AM0219](https://jvet-experts.org/doc_end_user/current_document.php?id=15866) EE2-4.4: On In-Loop filtering in ECM [D. Rusanovskyy, S. Hong, K. Panusopone, L. Wang, J. Lainema (Nokia), N. Hu, M. Karczewicz, M. Coban, H. Wang, Y. Shao, J. Wang, Y. Li, V. Seregin (Qualcomm)]

[JVET-AM0241](https://jvet-experts.org/doc_end_user/current_document.php?id=15888) crosscheck of JVET-AM0219 (EE2-4.4) [T. Poirier, F. Galpin (InterDigital)] [late] [miss]

[JVET-AM0228](https://jvet-experts.org/doc_end_user/current_document.php?id=15875) EE2-3.4: Reduced zero-out for NSPT kernels [G. Verba, M. Coban, V. Seregin, M. Karczewicz (Qualcomm)]

[JVET-AM0262](https://jvet-experts.org/doc_end_user/current_document.php?id=15929) Crosscheck of JVET-AM0228 (EE2-3.4: Reduced zero-out for NSPT kernels) [M. Abdoli (Xiaomi)] [late] [miss]

[JVET-AM0229](https://jvet-experts.org/doc_end_user/current_document.php?id=15876) EE2-1.3: Intra TMP sub-modes depending on the template type information [T. Dumas, K. Naser, M. Radosavljević, F. Le Léannec (InterDigital)]

[JVET-AM0248](https://jvet-experts.org/doc_end_user/current_document.php?id=15915) Crosscheck of JVET-AM0229 (EE2-1.3: Intra TMP sub-modes depending on the template type information) [H. Qin, V. Rufitskiy, A. Filippov (TCL)] [late] [miss]

[JVET-AM0231](https://jvet-experts.org/doc_end_user/current_document.php?id=15878) EE2-4.5: On performance improvement of NN-ILF in ALF [N. Hu, M. Karczewicz, M. Coban, H. Wang, Y. Shao, J. Wang, Y. Li, V. Seregin (Qualcomm), D. Rusanovskyy, S. Hong, K. Panusopone, L. Wang, J. Lainema (Nokia)]

[JVET-AM0240](https://jvet-experts.org/doc_end_user/current_document.php?id=15887) crosscheck of JVET-AM0231 (EE2-4.5) [F. Galpin, T. Poirier (InterDigital)] [late] [miss]

[JVET-AM0232](https://jvet-experts.org/doc_end_user/current_document.php?id=15879) EE2-1.4: combination of EE2-1.2c and EE2-1.3 [J. Fu, Y. Zhao, J. Zhang, S. Ma (PKU), Y. Gao, C. Huang (ZTE), T. Dumas, K. Naser, M. Radosavljević, S. Puri (InterDigital), D. Ruiz Coll, J.-K. Lee (Ofinno)]

[JVET-AM0249](https://jvet-experts.org/doc_end_user/current_document.php?id=15916) Crosscheck of JVET-AM0232 (EE2-1.4: combination of EE2-1.2c and EE2-1.3) [H. Qin, V. Rufitskiy, A. Filippov (TCL)] [late] [miss]

[JVET-AM0233](https://jvet-experts.org/doc_end_user/current_document.php?id=15880) EE2-1.5: combination of EE2-1.1 and EE2-1.4 [Y.-H. Lin, C.-Y. Teng, K,-W. Liang, Y.-C. Yang (Sharp), J. Fu, Y. Zhao, J. Zhang, S. Ma (PKU), Y. Gao, C. Huang (ZTE), T. Dumas, K. Naser, M. Radosavljević, S. Puri (InterDigital), D. Ruiz Coll, J.-K. Lee (Ofinno)]

[JVET-AM0250](https://jvet-experts.org/doc_end_user/current_document.php?id=15917) Crosscheck of JVET-AM0233 (EE2-1.5: combination of EE2-1.1 and EE2-1.4) [H. Qin, V. Rufitskiy, A. Filippov (TCL)] [late] [miss]

[JVET-AM0299](https://jvet-experts.org/doc_end_user/current_document.php?id=15967) EE2-1.11: a combination of EE2-1.2c and EE2-1.6a [J. Fu, J. Zhang, S. Ma (Peking University), Y. Gao, C. Huang (ZTE), T. Dumas, K. Naser, M. Radosavljević, S. Puri (InterDigital), M.Blestel, P. Andrivon, K. Suverov, N. Zouidi, D. Ruiz Coll, J.-K. Lee (Ofinno), Y. Chang, V. Seregin, M. Karczewicz (Qualcomm Inc.)] [late]

[JVET-AM0302](https://jvet-experts.org/doc_end_user/current_document.php?id=15970) Crosscheck of JVET-AM0299 (EE2-1.11: a combination of EE2-1.2c and EE2-1.6a) [X. Li (Alibaba)] [late] [miss]

### EE2 related contributions (8)

Contributions in this area were discussed during XXXX–XXXX on XXday XX June 2025 (chaired by XXX).

[JVET-AM0055](https://jvet-experts.org/doc_end_user/current_document.php?id=15702) EE2-3.6 related: On Context Budget Control for Transform Skip Residual Coding [T. N. Canh, P. Yin, S. McCarthy (Dolby)]

[JVET-AM0064](https://jvet-experts.org/doc_end_user/current_document.php?id=15711) EE2-related: Updated multi-models’ usage strategy for ALF-CCCM [N. Song, L. Xu, Z. Xie, Y. Yu, H. Yu, D. Wang (OPPO)]

[JVET-AM0278](https://jvet-experts.org/doc_end_user/current_document.php?id=15945) Crosscheck of JVET-AM0064 (EE2-related: Updated multi-models’ usage strategy for ALF-CCCM) [C. Ma (Kwai)] [late] [miss]

[JVET-AM0104](https://jvet-experts.org/doc_end_user/current_document.php?id=15751) EE2-related: On reference sample filtering for TIMD [V. Rufitskiy, A. Filippov, T. Dong (TCL)]

[JVET-AM0105](https://jvet-experts.org/doc_end_user/current_document.php?id=15752) EE2-related: Candidate replacement in MPM list [H. Tian, Y. Gao, S. Li, J. Lei (Shandong Univ.), B. Li, F. Xing, P. Han (Hisense)] [late]

[JVET-AM0127](https://jvet-experts.org/doc_end_user/current_document.php?id=15774) EE2-3.6 related: Advanced Budget Control for TSRC [R. Xu, W. Zhang, F. Yang (Xidian Univ.), B. Li, F. Xing, P. Han, Z. Wang, W. Song (Hisense)]

[JVET-AM0139](https://jvet-experts.org/doc_end_user/current_document.php?id=15786) EE2-related: On Chained Motion Vector Prediction [X. Zeng, M. Jia, Z. Li, C. Huang (ZTE)]

[JVET-AM0284](https://jvet-experts.org/doc_end_user/current_document.php?id=15951) Crosscheck of JVET-AM0139 (EE2-related: On Chained Motion Vector Prediction) [Z. Xie (OPPO)] [late] [miss]

[JVET-AM0176](https://jvet-experts.org/doc_end_user/current_document.php?id=15823) EE2-related: ECM NNLF evaluation using AhG11 trained models [T. Poirier, F. Galpin (InterDigital)]

[JVET-AM0217](https://jvet-experts.org/doc_end_user/current_document.php?id=15864) EE2-related: Simplification of TMVP Refinement [T. M. Bae, S. Deshpande (Sharp)]

### ECM modifications and software improvements beyond EE2 (30)

#### Intra and CIIP (11)

Contributions in this area were discussed during XXXX–XXXX on XXday XX June 2025 (chaired by XXX).

[JVET-AM0067](https://jvet-experts.org/doc_end_user/current_document.php?id=15714) Non-EE2: Enhanced CCP merge mode with BVG-CCCM model [H. Zhang, Y. Yu, H. Yu, D. Wang (OPPO)]

[JVET-AM0076](https://jvet-experts.org/doc_end_user/current_document.php?id=15723) Non-EE2: Enhanced DD-CCP and CCP-Merge Fusion [P. Bordes, T. Dumas, F. Galpin, Y. Chen (InterDigital)]

[JVET-AM0140](https://jvet-experts.org/doc_end_user/current_document.php?id=15787) Non-EE2: Modifications of the unwrapping and interpolation filtering processes for angular modes [V. Rufitskiy, A. Filippov, T. Dong (TCL)]

[JVET-AM0141](https://jvet-experts.org/doc_end_user/current_document.php?id=15788) Non-EE2: Adaptive Planar Weight for DIMD [J.-H. Lee, K. Choi (KHU), C. W. Ryu (Kaon Group)]

[JVET-AM0145](https://jvet-experts.org/doc_end_user/current_document.php?id=15792) AHG12: TMRL blend [S. Blasi, G. Kulupana, D. Bugdayci Sansli, J. Lainema (Nokia)]

[JVET-AM0149](https://jvet-experts.org/doc_end_user/current_document.php?id=15796) Non-EE2: On filtering for angular modes [T. Dong, V. Rufitskiy, A. Filippov (TCL)]

[JVET-AM0150](https://jvet-experts.org/doc_end_user/current_document.php?id=15797) Non-EE2: Extension of reconstructed area types for EIP [W. Niu, S. Xie, M. Jia, Y. Bai, C. Huang (ZTE)]

[JVET-AM0274](https://jvet-experts.org/doc_end_user/current_document.php?id=15941) Crosscheck of JVET-AM0150 (Non-EE2: Extension of reconstructed area types for EIP) [C. Zhou (vivo)] [late] [miss]

[JVET-AM0167](https://jvet-experts.org/doc_end_user/current_document.php?id=15814) Non-EE2: On long-tap interpolation filtering for angular modes [T. Dong, V. Rufitskiy, A. Filippov (TCL)]

[JVET-AM0169](https://jvet-experts.org/doc_end_user/current_document.php?id=15816) Non-EE2: Reducing Candidate Modes in DDCCP [S. Wan, Y. Yin, Z. Zhu (NWPU), S. Xie, X. Zeng, C. Huang (ZTE)]

[JVET-AM0196](https://jvet-experts.org/doc_end_user/current_document.php?id=15843) Non-EE2: Adaptive subsampling filter selection for CCLM/CCCM [Y. Kidani, H. Kato, K. Kawamura (KDDI)]

[JVET-AM0301](https://jvet-experts.org/doc_end_user/current_document.php?id=15969) AHG12: IntraTMP with DMVR [K. Naser, F. Le Léannec, P. Bordes, P. Le Guyadec (InterDigital)] [late]

#### Inter (5)

Contributions in this area were discussed during XXXX–XXXX on XXday XX June 2025 (chaired by XXX).

[JVET-AM0072](https://jvet-experts.org/doc_end_user/current_document.php?id=15719) Non-EE2: Diversity reordering for ARMC pairwise candidates [C. Wang, Y. Yu, L. Zhang, Z. Xie, H. Yu, D. Wang (OPPO)]

[JVET-AM0281](https://jvet-experts.org/doc_end_user/current_document.php?id=15948) Crosscheck of JVET-AM0072 (Non-EE2: Diversity reordering for ARMC pairwise candidates) [N. Zhang (Bytedance)] [late] [miss]

[JVET-AM0107](https://jvet-experts.org/doc_end_user/current_document.php?id=15754) AHG12: Generated Merge Candidates [D. Bugdayci Sansli, J. Lainema (Nokia)]

[JVET-AM0132](https://jvet-experts.org/doc_end_user/current_document.php?id=15779) AHG12: Amvp temporal candidates derived from temporal collocated picture [Z. Li, X. Zeng, M. Jia, C. Huang (ZTE)]

[JVET-AM0259](https://jvet-experts.org/doc_end_user/current_document.php?id=15926) Crosscheck of JVET-AM0132 (AHG12: Amvp temporal candidates derived from temporal collocated picture) [K. Jia (Alibaba)] [late] [miss]

[JVET-AM0148](https://jvet-experts.org/doc_end_user/current_document.php?id=15795) Non-EE2: Multi-template selection for inter CCP merge mode with zero luma CBF [J. Huo, J. Liu, Y. Ma, F. Yang (Xidian Univ.)]

[JVET-AM0254](https://jvet-experts.org/doc_end_user/current_document.php?id=15921) Crosscheck of JVET-AM0148 (Non-EE2: Multi-template selection for inter CCP merge mode with zero luma CBF) [X. Li (Alibaba)] [late] [miss]

[JVET-AM0247](https://jvet-experts.org/doc_end_user/current_document.php?id=15894) Non-EE2: Extension of AMVP MVP Index Range [T. M. Bae, S. Deshpande (Sharp)] [late]

#### GPM (3)

Contributions in this area were discussed during XXXX–XXXX on XXday XX June 2025 (chaired by XXX).

[JVET-AM0065](https://jvet-experts.org/doc_end_user/current_document.php?id=15712) Non-EE2: Joint reordering of GPM with intra prediction [Z. Sun, Y. Yu, L. Zhang, H. Yu, D. Wang (OPPO)]

[JVET-AM0303](https://jvet-experts.org/doc_end_user/current_document.php?id=15971) Crosscheck of JVET-AM0065 (Non-EE2: Joint reordering of GPM with intra prediction) [X. Li (Alibaba)] [late] [miss]

[JVET-AM0066](https://jvet-experts.org/doc_end_user/current_document.php?id=15713) Non-EE2: Joint reordering of GPM with affine prediction [L. Zhang, Y. Yu, Z. Sun, H. Yu, D. Wang (OPPO)]

[JVET-AM0277](https://jvet-experts.org/doc_end_user/current_document.php?id=15944) Crosscheck of JVET-AM0066 (Non-EE2: Joint reordering of GPM with affine prediction) [C. Ma (Kwai)] [late] [miss]

[JVET-AM0129](https://jvet-experts.org/doc_end_user/current_document.php?id=15776) Non-EE2: binarization improvement of GPM [X. Wang, J. Chen, Ce Zhu, L. Luo, H. Guo (UESTC), Y. Huo, Y. Liu (Transsion)]

#### In-Loop Filters (7)

Contributions in this area were discussed during XXXX–XXXX on XXday XX June 2025 (chaired by XXX).

[JVET-AM0070](https://jvet-experts.org/doc_end_user/current_document.php?id=15717) Non-EE2: On regularization of ALF-CCCM [Z. Xie, N. Song, Y. Yu, H. Yu, D. Wang (OPPO)]

[JVET-AM0270](https://jvet-experts.org/doc_end_user/current_document.php?id=15937) Crosscheck of JVET-AM0070 (Non-EE2: On regularization of ALF-CCCM) [H. Qin, A. Filippov, J. Konieczny (TCL)] [late] [miss]

[JVET-AM0071](https://jvet-experts.org/doc_end_user/current_document.php?id=15718) AHG12: Extensions on ALF-CCCM [L. Xu, N. Song, Y. Yu, H. Yu, D. Wang (OPPO)]

[JVET-AM0297](https://jvet-experts.org/doc_end_user/current_document.php?id=15965) Crosscheck of JVET-AM0071 (AHG12: Extensions on ALF-CCCM) [W. Yin (Bytedance)] [late] [miss]

[JVET-AM0110](https://jvet-experts.org/doc_end_user/current_document.php?id=15757) AHG12: Weighted averaging for bi-directional samples of TALF [K. Takada, S. Deshpande (Sharp)]

[JVET-AM0159](https://jvet-experts.org/doc_end_user/current_document.php?id=15806) Non-EE2: On ALF coefficient coding [I. Jumakulyyev, D. Bugdayci Sansli, J. Lainema (Nokia)]

[JVET-AM0264](https://jvet-experts.org/doc_end_user/current_document.php?id=15931) Crosscheck of JVET-AM0159 (Non-EE2: On ALF coefficient coding) [V. Shchukin (Ericsson)] [late] [miss]

[JVET-AM0171](https://jvet-experts.org/doc_end_user/current_document.php?id=15818) AHG12: On ALF-CCCM Model [F. Wang, N. Song, Z. Xie, Y. Yu, H. Yu, D. Wang (OPPO)]

[JVET-AM0279](https://jvet-experts.org/doc_end_user/current_document.php?id=15946) Crosscheck of JVET-AM0171 (AHG12: On ALF-CCCM Model) [C. Ma (Kwai)] [late] [miss]

[JVET-AM0183](https://jvet-experts.org/doc_end_user/current_document.php?id=15830) Non-EE2: Look-up table based loop filtering for ECM [Y. Du, J. Chen, A. Li, J. Liu, C. Zhu, L. Luo, H. Guo (UESTC), Y. Huo, Y. Liu (Transsion)]

[JVET-AM0285](https://jvet-experts.org/doc_end_user/current_document.php?id=15952) AHG12: Reuse of TALF control information [Y. Bai, M. Jia, W. Niu, S. Xie, C. Huang (ZTE)] [late]

#### Entropy coding, transforms, quantization, and transform coefficient coding (3)

Contributions in this area were discussed during XXXX–XXXX on XXday XX June 2025 (chaired by XXX).

[JVET-AM0068](https://jvet-experts.org/doc_end_user/current_document.php?id=15715) AHG12: On Shifting Quantization Center [Y. Yu, H. Yu, J. Gan, L. Xu, H. Huang, F. Wang, Z. Xie, D. Wang (OPPO)]

[JVET-AM0263](https://jvet-experts.org/doc_end_user/current_document.php?id=15930) Crosscheck of JVET-AM0068 (AHG12: On Shifting Quantization Center) [P. Nikitin (Qualcomm)] [late] [miss]

[JVET-AM0265](https://jvet-experts.org/doc_end_user/current_document.php?id=15932) Crosscheck of JVET-AM0068 (AHG12: On Shifting Quantization Center) [M. Balcilar, F. Le Léannec (InterDigital)] [late] [miss]

[JVET-AM0069](https://jvet-experts.org/doc_end_user/current_document.php?id=15716) Non-EE2: On Sign Prediction [Y. Zhang, L. Xu, Y. Yu, J. Gan, H. Yu, D. Wang (OPPO)]

[JVET-AM0260](https://jvet-experts.org/doc_end_user/current_document.php?id=15927) Crosscheck of JVET-AM0069 (Non-EE2: On Sign Prediction) [K. Jia (Alibaba)] [late] [miss]

[JVET-AM0111](https://jvet-experts.org/doc_end_user/current_document.php?id=15758) AHG12: On Residual Sign Prediction [C. Hollmann, A. Filippov (TCL)]

#### Other (1)

Contributions in this area were discussed during XXXX–XXXX on XXday XX June 2025 (chaired by XXX).

[JVET-AM0130](https://jvet-experts.org/doc_end_user/current_document.php?id=15777) Non-EE2: On partitioning optimization [G. Wang, C. Zhou, Z. Lv (vivo)]

[JVET-AM0296](https://jvet-experts.org/doc_end_user/current_document.php?id=15964) Crosscheck of JVET-AM0130 (Non-EE2: On partitioning optimization) [Z. Deng (Bytedance)] [late] [miss]

### CTC for EE2/ECM and general ECM improvements (3)

Section kept for future use.

See also the discussion under section 4.4.

[JVET-AM0158](https://jvet-experts.org/doc_end_user/current_document.php?id=15805) [AHG3][AHG6] ECM software code quantity progress [T. Ikai (Sharp)]

See also in 4.3

[JVET-AM0216](https://jvet-experts.org/doc_end_user/current_document.php?id=15863) AHG12: Fixes for 12-bit internal bit depth in ECM [R. Yu, V. Seregin, M. Karczewicz (Qualcomm)]

[JVET-AM0273](https://jvet-experts.org/doc_end_user/current_document.php?id=15940) Crosscheck of JVET-AM0216 (AHG12: Fixes for 12-bit internal bit depth in ECM) [Y. Wang (Bytedance)] [late] [miss]

[JVET-AM0220](https://jvet-experts.org/doc_end_user/current_document.php?id=15867) AHG12: Fix on cabac\_init\_flag and Temporal Cabac Inheritance [B. Wang, R. Chernyak, Z. Xiang, S. Liu (Tencent)]

# High-level syntax (HLS) and related proposals (69)

## AHG9: Aspects of SEI messages in VSEI, VVC, HEVC and AVC (4+1)

Contributions in this area were discussed during XXXX–XXXX on XXday XX June 2025 (chaired by XXX).

[JVET-AM0162](https://jvet-experts.org/doc_end_user/current_document.php?id=15809) AHG9: Software implementation of attenuation map information metadata in the Green Metadata SEI message [C.-H. Demarty, F. Urban, E. François, F. Aumont (InterDigital)]

*JVET-AM0162 also relates to software for SEI messages*

[JVET-AM0189](https://jvet-experts.org/doc_end_user/current_document.php?id=15836) AHG9: On semantics of persistence flag of SEI messages in VSEI v4 and v3 [J. Lee, H. Tan, C. Kim, J. Nam, J. Lim, S. Kim (LGE)]

*JVET-AM0189 also relates to the study of JVET-AL2006 VSEI*

[JVET-AM0048](https://jvet-experts.org/doc_end_user/current_document.php?id=15695) AHG9/AHG2: Miscellaneous changes for HEVC [Y.-K. Wang, J. Xu (Bytedance)]

[JVET-AM0174](https://jvet-experts.org/doc_end_user/current_document.php?id=15821) AHG9: On general SEI payload constraints [Y. Sanchez, R. Skupin, T. M. Borges, K. Sühring, C. Hellge, T. Schierl (Fraunhofer HHI)]

[JVET-AM0292](https://jvet-experts.org/doc_end_user/current_document.php?id=15960) AHG9/AHG2: On the semantics of po\_num\_bits\_in\_prefix\_indication\_minus1[ i ] and po\_sei\_prefix\_data\_bit[ i ][ j ] [Y.-K. Wang (Bytedance)] [late]

## AHG9: Aspects related to VSEI version 4 (24)

### Editorial updates (3)

Contributions in this area were discussed during XXXX–XXXX on XXday XX June 2025 (chaired by XXX).

[JVET-AM0047](https://jvet-experts.org/doc_end_user/current_document.php?id=15694) AHG9: Miscellaneous changes for VSEI [Y.-K. Wang, J. Xu (Bytedance)]

*JVET-AM0047 also relates to modality information, digital signed content, and NNPFC SEI messages*

[JVET-AM0052](https://jvet-experts.org/doc_end_user/current_document.php?id=15699) AHG9: Editorial changes for VSEI [Y. He, S. Zhao, L. Kerofsky, M. Karczewicz (Qualcomm)]

[JVET-AM0191](https://jvet-experts.org/doc_end_user/current_document.php?id=15838) AHG9: Editorial updates for VSEI v4 [J. Lee, H. Tan, C. Kim, J. Nam, J. Lim, S. Kim (LGE)]

### SEI processing order and processing order nesting SEI messages (6)

Contributions in this area were discussed during XXXX–XXXX on XXday XX June 2025 (chaired by XXX).

[JVET-AM0080](https://jvet-experts.org/doc_end_user/current_document.php?id=15727) AHG9: On the PON SEI message [Y. He, L. Kerofsky, S. Zhao, M. Karczewicz (Qualcomm)]

[JVET-AM0081](https://jvet-experts.org/doc_end_user/current_document.php?id=15728) AHG9: On the PON dependency constraint [Y. He, L. Kerofsky, S. Zhao, M. Karczewicz (Qualcomm)]

[JVET-AM0082](https://jvet-experts.org/doc_end_user/current_document.php?id=15729) AHG9: On the PON nested FGC SEI message [Y. He, L. Kerofsky, S. Zhao, M. Karczewicz (Qualcomm)]

[JVET-AM0121](https://jvet-experts.org/doc_end_user/current_document.php?id=15768) AHG9: On the SEI processing order SEI message [M. M. Hannuksela, J. Boyce, F. Cricri (Nokia)]

[JVET-AM0166](https://jvet-experts.org/doc_end_user/current_document.php?id=15813) AHG9: Miscellaneous aspects in VSEI v4 [J. Nam, H. Tan, J. Lee, C. Kim, J. Lim, S. Kim (LGE)]

*JVET-AM0166 also relates to the MI and PRI SEI messages*

[JVET-AM0206](https://jvet-experts.org/doc_end_user/current_document.php?id=15853) AHG9: On signalling of sei payload type in SEI processing order SEI message [H. Tan, C. Kim, J. Nam, J. Lee, J. Lim, S. Kim (LGE)]

### NNPF SEI extensions (1+1)

Contributions in this area were discussed during XXXX–XXXX on XXday XX June 2025 (chaired by XXX).

[JVET-AM0047](https://jvet-experts.org/doc_end_user/current_document.php?id=15694) AHG9: Miscellaneous changes for VSEI [Y.-K. Wang, J. Xu (Bytedance)]

*JVET-AM0047 also relates to editorial changes in VSEI and the modality information and digital signed content SEI messages*

[JVET-AM0113](https://jvet-experts.org/doc_end_user/current_document.php?id=15760) AHG9: Supporting pre-processing aware post processing in the NNPFC SEI message [M. Damghanian, M. Pettersson, R. Sjöberg (Ericsson)]

### AI usage restrictions SEI message *(*3+1)

Contributions in this area were discussed during XXXX–XXXX on XXday XX June 2025 (chaired by XXX).

[JVET-AM0112](https://jvet-experts.org/doc_end_user/current_document.php?id=15759) AHG9: On AI usage restrictions SEI message [M. Pettersson, R. Sjöberg, M. Damghanian (Ericsson)]

[JVET-AM0117](https://jvet-experts.org/doc_end_user/current_document.php?id=15764) AHG9: On the AI usage restrictions SEI message [M. M. Hannuksela, F. Cricri (Nokia)]

[JVET-AM0152](https://jvet-experts.org/doc_end_user/current_document.php?id=15799) AHG9: AI usage restrictions for entities other than decoded pictures [C. Kim, H. Tan, J. Nam, J. Lee, J. Lim, S. Kim (LGE)]

[JVET-AM0189](https://jvet-experts.org/doc_end_user/current_document.php?id=15836) AHG9: On semantics of persistence flag of SEI messages in VSEI v4 and v3 [J. Lee, H. Tan, C. Kim, J. Nam, J. Lim, S. Kim (LGE)]

*JVET-AM0189 also relates to the SPTI, MI, TDI, and DSCV SEI messages and to the study of SEI messages in VSEI, VCC, HEVC, and AVC*

### Digitally signed content SEI messages (6+2)

Contributions in this area were discussed during XXXX–XXXX on XXday XX June 2025 (chaired by XXX).

[JVET-AM0047](https://jvet-experts.org/doc_end_user/current_document.php?id=15694) AHG9: Miscellaneous changes for VSEI [Y.-K. Wang, J. Xu (Bytedance)]

*JVET-AM0047 also relates to editorial changes in VSEI and the modality information and NNPFC SEI messages*

[JVET-AM0118](https://jvet-experts.org/doc_end_user/current_document.php?id=15765) AHG9: Digital signing of selected SEI messages [M. M. Hannuksela, J. Boyce (Nokia)]

[JVET-AM0119](https://jvet-experts.org/doc_end_user/current_document.php?id=15766) AHG9: On start and end flags of digitally signed content [M. M. Hannuksela, J. Boyce (Nokia)]

[JVET-AM0164](https://jvet-experts.org/doc_end_user/current_document.php?id=15811) AHG9: On DSC SEI [K. Sühring, T. Hinz, Y. Sanchez, J. Pfaff, H. Schwarz, D. Marpe, T. Wiegand (Fraunhofer HHI)]

[JVET-AM0189](https://jvet-experts.org/doc_end_user/current_document.php?id=15836) AHG9: On semantics of persistence flag of SEI messages in VSEI v4 and v3 [J. Lee, H. Tan, C. Kim, J. Nam, J. Lim, S. Kim (LGE)]

*JVET-AM0189 also relates to the SPTI, MI, TDI, and AUR SEI messages and to the study of SEI messages in VSEI, VCC, HEVC, and AVC*

[JVET-AM0190](https://jvet-experts.org/doc_end_user/current_document.php?id=15837) AHG9: On implicit association mode in digitally-signed content SEI messages in VSEI v4 [J. Lee, H. Tan, C. Kim, J. Nam, J. Lim, S. Kim (LGE)]

[JVET-AM0208](https://jvet-experts.org/doc_end_user/current_document.php?id=15855) AHG9: On aspects related to verification period in digitally-signed content SEI messages in VSEI v4 draft [H. Tan, J. Lee, J. Nam, C. Kim, J. Lim, S. Kim (LGE)]

[JVET-AM0210](https://jvet-experts.org/doc_end_user/current_document.php?id=15857) AHG9: On miscellaneous aspects in digitally-signed content SEI messages in VSEI v4 draft [H. Tan, J. Lee, J. Nam, C. Kim, J. Lim, S. Kim (LGE)]

### Packed regions information SEI message *(*2+1)

Contributions in this area were discussed during XXXX–XXXX on XXday XX June 2025 (chaired by XXX).

[JVET-AM0075](https://jvet-experts.org/doc_end_user/current_document.php?id=15722) AHG9: On packed regions information SEI message [T. Chujoh, Z. Fan, R. Ishimoto, T. Ikai (Sharp)]

[JVET-AM0166](https://jvet-experts.org/doc_end_user/current_document.php?id=15813) AHG9: Miscellaneous aspects in VSEI v4 [J. Nam, H. Tan, J. Lee, C. Kim, J. Lim, S. Kim (LGE)]

*JVET-AM0166 also relates to the SPO and MI SEI messages*

[JVET-AM0211](https://jvet-experts.org/doc_end_user/current_document.php?id=15858) AHG9: On the packed regions information SEI message [J. Xu, Y.-K. Wang (Bytedance)]

### Source picture timing information SEI message (1+1)

Contributions in this area were discussed during 1–XXXX and XXXX–XXXX on XXday XX March 2025 (chaired by XXX).

[JVET-AM0165](https://jvet-experts.org/doc_end_user/current_document.php?id=15812) AHG9: On value range and reserved values for syntax elements in VSEI v4 [J. Nam, H. Tan, J. Lee, C. Kim, J. Lim, S. Kim (LGE)]

*JVET-AM0165 also relates to the EOI, MI, TDI, and IFM messages*

[JVET-AM0189](https://jvet-experts.org/doc_end_user/current_document.php?id=15836) AHG9: On semantics of persistence flag of SEI messages in VSEI v4 and v3 [J. Lee, H. Tan, C. Kim, J. Nam, J. Lim, S. Kim (LGE)]

*JVET-AM0189 also relates to the MI, TDI, DSCV, and AUR SEI messages and to the study of SEI messages in VSEI, VCC, HEVC, and AVC*

### Modality information SEI message (0+4)

Contributions in this area were discussed during XXXX–XXXX and XXXX–XXXX on XXday XX March 2025 (chaired by XXX).

[JVET-AM0047](https://jvet-experts.org/doc_end_user/current_document.php?id=15694) AHG9: Miscellaneous changes for VSEI [Y.-K. Wang, J. Xu (Bytedance)]

*JVET-AM0047 also relates to editorial changes in VSEI and the digital signed content and NNPFC SEI messages*

[JVET-AM0165](https://jvet-experts.org/doc_end_user/current_document.php?id=15812) AHG9: On value range and reserved values for syntax elements in VSEI v4 [J. Nam, H. Tan, J. Lee, C. Kim, J. Lim, S. Kim (LGE)]

*JVET-AM0165 also relates to the EOI, SPTI, TDI, and IFM SEI messages*

[JVET-AM0166](https://jvet-experts.org/doc_end_user/current_document.php?id=15813) AHG9: Miscellaneous aspects in VSEI v4 [J. Nam, H. Tan, J. Lee, C. Kim, J. Lim, S. Kim (LGE)]

*JVET-AM0166 also relates to the SPO and PRI SEI messages*

[JVET-AM0189](https://jvet-experts.org/doc_end_user/current_document.php?id=15836) AHG9: On semantics of persistence flag of SEI messages in VSEI v4 and v3 [J. Lee, H. Tan, C. Kim, J. Nam, J. Lim, S. Kim (LGE)]

*JVET-AM0189 also relates to the SPTI, TDI, DSCV, and AUR SEI messages and to the study of SEI messages in VSEI, VCC, HEVC, and AVC*

### Text description information SEI message (1+2)

[JVET-AM0098](https://jvet-experts.org/doc_end_user/current_document.php?id=15745) AHG9: On the TDI SEI message [Y. He, L. Kerofsky, S. Zhao, M. Karczewicz (Qualcomm)]

[JVET-AM0165](https://jvet-experts.org/doc_end_user/current_document.php?id=15812) AHG9: On value range and reserved values for syntax elements in VSEI v4 [J. Nam, H. Tan, J. Lee, C. Kim, J. Lim, S. Kim (LGE)]

*JVET-AM0047 also relates to the EOI, SPTI, MI, and IFM SEI messages*

[JVET-AM0189](https://jvet-experts.org/doc_end_user/current_document.php?id=15836) AHG9: On semantics of persistence flag of SEI messages in VSEI v4 and v3 [J. Lee, H. Tan, C. Kim, J. Nam, J. Lim, S. Kim (LGE)]

*JVET-AM0189 also relates to the SPTI, MI, DSCV, and AUR SEI messages and to the study of SEI messages in VSEI, VCC, HEVC, and AVC*

### Other (1+1)

Contributions in this area were discussed during 1–XXXX and XXXX–XXXX on XXday XX March 2025 (chaired by XXX).

[JVET-AM0091](https://jvet-experts.org/doc_end_user/current_document.php?id=15738) AHG9: On GFV SEI chroma key [J. Boyce, M. M. Hannuksela (Nokia)]

[JVET-AM0165](https://jvet-experts.org/doc_end_user/current_document.php?id=15812) AHG9: On value range and reserved values for syntax elements in VSEI v4 [J. Nam, H. Tan, J. Lee, C. Kim, J. Lim, S. Kim (LGE)]

*Aspects on EOI and IFM – JVET-AM0165 also relates to the SPTI, MI, and TDI SEI messages*

## AHG9: Extensions of SEI messages in VSEI (2)

Contributions in this area were discussed during XXXX–XXXX on XXday XX June 2025 (chaired by XXX).

[JVET-AM0090](https://jvet-experts.org/doc_end_user/current_document.php?id=15737) AHG9: SDI SEI extension for signalling described layer of confidence layer [J. Boyce, M. M. Hannuksela (Nokia)]

[JVET-AM0100](https://jvet-experts.org/doc_end_user/current_document.php?id=15747) AHG9: Shutter interval information SEI message extension for rolling shutter cameras [L. Kerofsky, Y. He, S. Zhao, M. Karczewicz (Qualcomm)]

## AHG9: Aspects on SEI messages in TuC for VSEI (30)

### NNPF SEI messages *(*2)

Contributions in this area were discussed during XXXX–XXXX on XXday XX June 2025 (chaired by XXX).

[JVET-AM0087](https://jvet-experts.org/doc_end_user/current_document.php?id=15734) AHG9: Comments on VSEI TuC [S. Deshpande (Sharp)]

[JVET-AM0173](https://jvet-experts.org/doc_end_user/current_document.php?id=15820) AHG9: NNPFA SEI message extension for multi-purpose NNPFs [C.-H. Demarty, E. François, A. Ak (InterDigital), M. Hannuskela, F. Cricri (Nokia)]

### Constituent rectangles SEI (2)

Contributions in this area were discussed during XXXX–XXXX on XXday XX June 2025 (chaired by XXX).

[JVET-AM0092](https://jvet-experts.org/doc_end_user/current_document.php?id=15739) AHG9: Editorial changes on the CR SEI message [Y. He, S. Zhao, L. Kerofsky, M. Karczewicz (Qualcomm)]

[JVET-AM0093](https://jvet-experts.org/doc_end_user/current_document.php?id=15740) AHG9: On the CR SEI message [Y. He, S. Zhao, L. Kerofsky, M. Karczewicz (Qualcomm)]

### Display rectangles SEI (2)

Contributions in this area were discussed during XXXX–XXXX on XXday XX June 2025 (chaired by XXX).

[JVET-AM0095](https://jvet-experts.org/doc_end_user/current_document.php?id=15742) AHG9: On the DR SEI message [Y. He, S. Zhao, L. Kerofsky, M. Karczewicz (Qualcomm)]

[JVET-AM0146](https://jvet-experts.org/doc_end_user/current_document.php?id=15793) AHG9: On display rectangles with same display aspect ratio as cropped decoded picture [T. Biatek, J. Boyce, M. M. Hannuksela (Nokia)]

### SEI processing order and processing order nesting SEI messages (2)

Contributions in this area were discussed during XXXX–XXXX on XXday XX June 2025 (chaired by XXX).

[JVET-AM0079](https://jvet-experts.org/doc_end_user/current_document.php?id=15726) AHG9: On the SPO SEI message [Y. He, L. Kerofsky, S. Zhao, M. Karczewicz (Qualcomm)]

[JVET-AM0155](https://jvet-experts.org/doc_end_user/current_document.php?id=15802) AHG9: On the SPO SEI message complexity signaling [Y. Gao, P. Wu, S. Xie, Y. Bai, C. Huang (ZTE)]

### Encoder optimization information SEI message (2)

Contributions in this area were discussed during XXXX–XXXX on XXday XX June 2025 (chaired by XXX).

[JVET-AM0126](https://jvet-experts.org/doc_end_user/current_document.php?id=15773) AHG9: Temporal quality indication for EOI SEI message [J. Chen, Y. Ye, B. Chen (Alibaba)]

[JVET-AM0179](https://jvet-experts.org/doc_end_user/current_document.php?id=15826) AHG9: Depth-aware optimization for Encoder optimization information SEI message [G. Teniou, S. Wenger, A. Hinds (Tencent)]

### Digitally signed content messages (4)

Contributions in this area were discussed during XXXX–XXXX on XXday XX June 2025 (chaired by XXX).

[JVET-AM0156](https://jvet-experts.org/doc_end_user/current_document.php?id=15803) AHG9: On Digitally Signing a SEI message [Y. Gao, P. Wu, Y. Bai, S. Xie, C. Huang (ZTE)]

[JVET-AM0160](https://jvet-experts.org/doc_end_user/current_document.php?id=15807) AHG9: On including SEI messages in the digitally signed content [C. Kim, H. Tan, J. Nam, J. Lee, J. Lim, S. Kim (LGE)]

[JVET-AM0193](https://jvet-experts.org/doc_end_user/current_document.php?id=15840) AHG9: On digitally-signed content SEI messages for subpicture support in TuC of VSEI [J. Lee, H. Tan, C. Kim, J. Nam, J. Lim, S. Kim (LGE)]

[JVET-AM0205](https://jvet-experts.org/doc_end_user/current_document.php?id=15852) AHG9: Digitally signed content: use of Picture ID for overlay area exclusion [I. Sodagar, C. Fersch, S. McCarthy (Dolby Labs)]

### Film grain regions characteristics SEI message (2+2)

Contributions in this area were discussed during XXXX–XXXX on XXday XX June 2025 (chaired by XXX).

[JVET-AM0085](https://jvet-experts.org/doc_end_user/current_document.php?id=15732) AHG9/AHG13: On Film Grain Regions Characteristics SEI message [S. Deshpande, J. Samuelsson-Allendes (Sharp)]

[JVET-AM0124](https://jvet-experts.org/doc_end_user/current_document.php?id=15771) [AHG9/AHG13]: On typo fix and interface software contribution to the FGRC SEI message [S. Xie, W. Niu, P. Wu, Y. Gao, C. Huang (ZTE)]

*JVET-AM0124 also relates to software for SEI messages*

[JVET-AM0168](https://jvet-experts.org/doc_end_user/current_document.php?id=15815) [AHG9/AHG13] Implementation in VTM TuC of the film grain regions characteristics SEI message [F. Urban, E. François, P. de Lagrange (InterDigital), G. Teniou (Tencent)]

*JVET-AM0168 also relates to software for SEI messages*

[JVET-AM0230](https://jvet-experts.org/doc_end_user/current_document.php?id=15877) AHG9/AHG13: Reference picture resolution for the FGR SEI message [E. François, P. de Lagrange, F. Urban (InterDigital)]

### Lens optical correction SEI message (2)

Contributions in this area were discussed during XXXX–XXXX on XXday XX June 2025 (chaired by XXX).

[JVET-AM0101](https://jvet-experts.org/doc_end_user/current_document.php?id=15748) AHG9: On Lens Optical Correction SEI message [L. Kerofsky, Y. He, S. Zhao, M. Karczewicz (Qualcomm)]

[JVET-AM0102](https://jvet-experts.org/doc_end_user/current_document.php?id=15749) AHG9: Additional models for the LOC SEI message [L. Kerofsky, Y. He, S. Zhao, M. Karczewicz (Qualcomm)]

### Display overlays information SEI message (3)

Contributions in this area were discussed during XXXX–XXXX on XXday XX June 2025 (chaired by XXX).

[JVET-AM0094](https://jvet-experts.org/doc_end_user/current_document.php?id=15741) AHG9: On the DOI SEI message [Y. He, S. Zhao, L. Kerofsky, M. Karczewicz (Qualcomm)]

[JVET-AM0147](https://jvet-experts.org/doc_end_user/current_document.php?id=15794) AHG9: On applying display overlays on display rectangles [T. Biatek, J. Boyce, M. M. Hannuksela (Nokia)]

[JVET-AM0180](https://jvet-experts.org/doc_end_user/current_document.php?id=15827) AHG9: Overlay purpose indicator for Display overlays information SEI message [G. Teniou, S. Wenger, A. Hinds (Tencent)]

### Picture segment information SEI message (2)

Contributions in this area were discussed during XXXX–XXXX on XXday XX June 2025 (chaired by XXX).

[JVET-AM0097](https://jvet-experts.org/doc_end_user/current_document.php?id=15744) AHG9: On the PSI SEI message [Y. He, L. Kerofsky, S. Zhao, M. Karczewicz (Qualcomm)]

[JVET-AM0192](https://jvet-experts.org/doc_end_user/current_document.php?id=15839) AHG9: On picture segmentation SEI message in TuC of VSEI [J. Lee, H. Tan, C. Kim, J. Nam, J. Lim, S. Kim (LGE)]

### Danmu information SEI message (3)

Contributions in this area were discussed during XXXX–XXXX on XXday XX June 2025 (chaired by XXX).

[JVET-AM0154](https://jvet-experts.org/doc_end_user/current_document.php?id=15801) AHG9: On danmu information SEI message [C. Kim, H. Tan, J. Nam, J. Lee, J. Lim, S. Kim (LGE)]

[JVET-AM0161](https://jvet-experts.org/doc_end_user/current_document.php?id=15808) AHG9: On display timing in the danmu information SEI message [C. Kim, H. Tan, J. Nam, J. Lee, J. Lim, S. Kim (LGE)]

[JVET-AM0182](https://jvet-experts.org/doc_end_user/current_document.php?id=15829) AHG9: On the Danmu SEI message [S. Zhao, Y. He, L. Kerofsky, M. Karczewicz (Qualcomm)]

### Other (4)

Contributions in this area were discussed during XXXX–XXXX on XXday XX June 2025 (chaired by XXX).

[JVET-AM0086](https://jvet-experts.org/doc_end_user/current_document.php?id=15733) AHG9: On Photosensitive Content Information Signaling [S. Deshpande (Sharp)]

[JVET-AM0096](https://jvet-experts.org/doc_end_user/current_document.php?id=15743) AHG9: On the QM SEI message [Y. He, L. Kerofsky, S. Zhao, M. Karczewicz (Qualcomm)]

[JVET-AM0099](https://jvet-experts.org/doc_end_user/current_document.php?id=15746) AHG9: On the BRI SEI message [Y. He, L. Kerofsky, S. Zhao, M. Karczewicz (Qualcomm)]

[JVET-AM0108](https://jvet-experts.org/doc_end_user/current_document.php?id=15755) AHG9: On colour mapping information SEI message [J. Samuelsson-Allendes, S. Deshpande (Sharp)]

## Additional SEI message aspects (6)

Contributions in this area were discussed during XXXX–XXXX on XXday XX June 2025 (chaired by XXX).

[JVET-AM0083](https://jvet-experts.org/doc_end_user/current_document.php?id=15730) AHG9: Auxiliary sampling alignment and transformation information SEI [V. Zakharchenko, J. Boyce, D. Rusanovskyy, M. M. Hannuksela (Nokia)]

[JVET-AM0103](https://jvet-experts.org/doc_end_user/current_document.php?id=15750) AHG9: Camera Extrinsic Information SEI message [L. Kerofsky, Y. He, S. Zhao, M. Karczewicz (Qualcomm)]

[JVET-AM0153](https://jvet-experts.org/doc_end_user/current_document.php?id=15800) AHG9: Loss recovery information SEI message [C. Kim, H. Tan, J. Nam, J. Lee, J. Lim, S. Kim (LGE)]

[JVET-AM0181](https://jvet-experts.org/doc_end_user/current_document.php?id=15828) AHG9: Proposed new SEI message on 3d model reconstruction information [G. Teniou, S. Wenger, A. Hinds, J. Ricard (Tencent)]

[JVET-AM0184](https://jvet-experts.org/doc_end_user/current_document.php?id=15831) AHG9: Picture Reference Degree SEI Message [S. Zhao, Y. He, L. Kerofsky, M. Karczewicz (Qualcomm)]

[JVET-AM0212](https://jvet-experts.org/doc_end_user/current_document.php?id=15859) AHG9: Gaussian splatting information SEI message D. Wang, J. Xu, L. Zhang, Y.-K. Wang, S. Jiao (Bytedance)

*JVET-AM0212 also relates to software for SEI messages*

## SEI Software and showcases (3+1)

Contributions in this area were discussed during XXXX–XXXX on XXday XX June 2025 (chaired by XXX).

[JVET-AM0124](https://jvet-experts.org/doc_end_user/current_document.php?id=15771) [AHG9/AHG13]: On typo fix and interface software contribution to the FGRC SEI message [S. Xie, W. Niu, P. Wu, Y. Gao, C. Huang (ZTE)]

[JVET-AM0168](https://jvet-experts.org/doc_end_user/current_document.php?id=15815) [AHG9/AHG13] Implementation in VTM TuC of the film grain regions characteristics SEI message [F. Urban, E. François, P. de Lagrange (InterDigital), G. Teniou (Tencent)]

*JVET-AM0124 and JVET-AM0168 also relate to the film grain regions characteristics SEI message*

[JVET-AM0162](https://jvet-experts.org/doc_end_user/current_document.php?id=15809) AHG9: Software implementation of attenuation map information metadata in the Green Metadata SEI message [C.-H. Demarty, F. Urban, E. François, F. Aumont (InterDigital)]

*JVET-AM0162 also relates to the study of SEI messages in VVC, HEVC, and AVC*

[JVET-AM0212](https://jvet-experts.org/doc_end_user/current_document.php?id=15859) AHG9: Gaussian splatting information SEI message D. Wang, J. Xu, L. Zhang, Y.-K. Wang, S. Jiao (Bytedance)

*JVET- AM0212 also relates to identifying potential needs for new SEI messages*

## Non-SEI HLS aspects (0)

Kept as template for future use.

# Plenary meetings, joint meetings, BoG reports, and liaison communications (update)

## General

The following topics were discussed in JVET plenary Monday 30 June XXXX–XXXX:

* Status of last meeting’s output documents
* Liaison communication –
	+ Response to m72555 should be handled at SC29 level
	+ to JPEG, regarding information on investigations of AI based I picture coding, mention relevance of bit-exact reconstruction investigations. E. Alshina will prepare a draft, review on Thursday morning
* Scheduling for the remaining week (further detail on scheduling is recorded in section 2.12).
* Review status from tracks and discussion on potential open issues
	+ It was agreed to review documents with highest priority first.
* Review of documents at plenary level

Specific discussion on some general issues related to HLS was as follows:

…

## MPEG information sharing meetings

Information sharing sessions with other WGs and AGs of the MPEG community were held on Monday 31 March 0500–0800, Wednesday 2 April 0500–0600, and Friday 4 April 2100–2300.

The status and plans for the work in the MPEG WGs and AGs was reviewed at these information sharing sessions.

## Joint meetings

### Joint sessions 1530-1730 Monday 31 March and 0500-0700 Thursday 03 April on next generation video standardization: MPEG WG 2 / Requirements, MPEG WG 5 / JVET and VCEG (ITU-T Q6/21)

## BoGs (1)

## Liaison communications (1)

The following liaison statements were received at this meeting (section retained as a template for future use).

The liaison document WG 5 N 356 was reviewed in JVET on Thursday 03 April at 1300-1320. The draft reply was also presented in the MPEG AG 3 Communication meeting Thursday 03 April during 1300-1500.

# Project planning

## Software timeline (update)

ECM 17.0 software (including all adoptions) was planned to be available 3 weeks after the meeting (25 April).

The NNVC 13.0 codebase software was planned to be available 3 weeks after the meeting (25 April).

VTM23.9 software will be released 1 week after the meeting. Additional versions will be released as appropriate (e.g. for integration and updates of SEI messages included in JVET-AL2006 by the current meeting).

Updates on top of HM18.0 and JM19.1 software will be released as appropriate (e.g., integration and updates of SEI messages included in JVET-AL1006 and JVET-AL1017 by the current meeting).

As a general rule in software development, a person who is executing a merge shall not be from the same company as the person who submitted that merge request.

## Core experiment and exploration experiment planning

An EE on neural network-based video coding was established, as recorded in output document JVET-AM2023.

An EE on enhanced compression technology beyond VVC capability using techniques other than neural-network technology was also established, as recorded in output document JVET-AM2024.

Initial versions of these documents were presented and approved.

## Drafting of specification text, encoder algorithm descriptions, and software

The following agreement has been established: the editorial team has the discretion to not integrate recorded adoptions for which the available text is grossly inadequate (and cannot be fixed with a reasonable degree of effort), if such a situation hypothetically arises. In such an event, the text would record the intent expressed by the committee without including a full integration of the available inadequate text.

## Plans for improved efficiency and contribution consideration

The group considered it important to have the full design of proposals documented to enable proper study.

Adoptions need to be based on properly drafted working draft text (on normative elements) and HM/VTM encoder algorithm descriptions – relative to the existing drafts. Proposal contributions should also provide a software implementation (or at least such software should be made available for study and testing by other participants at the meeting, and software must be made available to cross-checkers in EEs).

Suggestions for future meetings included the following generally-supported principles:

* Normative contributions (relating to changes in bitstream/decoder) shall include draft specification text
* Proposals shall contain all details relevant for understanding and be self-contained. In cases where the document is a follow-up of a previous contribution, the overall concept and the novelties should be highlighted at minimum
* Coding tool and encoder optimization proposals shall contain Excel sheets that allow assessment on a per-sequence basis
* Algorithm description text is strongly encouraged for non-normative contributions that are intended to be included in model description documents (VTM, ECM, etc.), and that is required for inclusion in TR drafts.
* Early upload deadline to enable substantial study prior to the meeting
* Using a clock timer to ensure efficient proposal presentations (5 min) and discussions (not exercised currently)

As general guidance, it was suggested to avoid usage of company names in document titles, software modules etc., and not to describe a technology by using a company name.

## General issues for experiments

It was emphasized that those rules which had been set up or refined during the 12th JVET meeting should be observed. In particular, for some CEs of some previous meetings, results were available late, and some changes in the experimental setup had not been sufficiently discussed on the JVET reflector.

Group coordinated experiments have been planned as follows:

* “Core experiments” (CEs) are the coordinated experiments on coding tools which are deemed to be interesting but require more investigation and could potentially become part of a draft standard by the next meeting or in the near future.
* “Exploration experiments” (EEs) are also coordinated experiments. These are conducted on technology which is not foreseen to become part of a draft standard in the near future. The investigating methodology for assessment of such technology can also be an important part of an EE. (Further general rules for EEs, as far as deviating from the CE rules below, should be discussed in a future meeting. For the current meeting, procedures as described in the EE description document are deemed to be sufficient.)
* A CE is a test of a specific fully described technology in a specific agreed way. It is not a forum for thinking of new ideas (like an AHG). The CE coordinators are responsible for making sure that the CE description is complete and correct and has adequate detail. Reflector discussions about CE description clarity and other aspects of CE plans are encouraged.
* A description of each experiment is to be approved at the meeting at which the experiment plan is established. This should include the issues that were raised by other experts when the tool was presented, e.g., interference with other tools, contribution of different elements that are part of a package, etc. The experiment description document should provide the names of individual people, not just company names.
* Software for tools investigated in a CE will be provided in one or more separate branches of the software repository. Each CE will have a “fork” of the software, and within the CE there may be multiple branches established by the CE coordinator. The software coordinator will help coordinate the creation of these forks and branches and their naming. All JVET members will have read access to the CE software branches (using shared read-only credentials as described below).
* During the experiment, revisions of the experiment plans can be made, but not substantial changes to the proposed technology. Withdrawing parts of experiments that were intended to show the individual benefits of a tool or parts of a tool is strongly discouraged. Combination tests may not be considered in such cases. Any changes made to individual tools in a combination shall be documented.
* The CE description must match the CE testing that is done. The CE description needs to be revised if there has been some change of plans.
* The CE summary report must describe any changes that were made in the process of finalizing the CE.
* By the next meeting it is expected that at least one independent cross-checker will report a detailed analysis of each proposed feature that has been tested and confirm that the implementation is correct. Commentary on the potential benefits and disadvantages of the proposed technology in cross-checking reports is highly encouraged. Having multiple cross-checking reports is also highly encouraged (especially if the cross-checking involves more than confirmation of correct test results). The reports of cross-checking activities may (and generally should) be integrated into the CE report rather than submitted as separate documents.
* It is mandatory to report encoder optimizations made for the benefit of a tool, and if an equivalent optimization could be applied on the anchor, a comparison against the improved anchor shall be provided.
* A new proposal can be included in a CE based on group decision, regardless if an independent party has already performed a cross-check in the meeting when it was first proposed.

It is possible to define sub-experiments within particular CEs, for example designated as CEX.a, CEX.b, etc., where X is the basic CE number.

As a general rule, it was agreed that each CE should be run under the same testing conditions using one software codebase, which should be based on the group test model software codebase. An experiment is not to be established as a CE unless there is access given to the participants in (any part of) the CE to the software used to perform the experiments.

The general agreed common conditions for single-layer coding efficiency experiments for SDR video are described in the prior output document JVET-T2010.

Experiment descriptions should be written in a way such that it is understood as a JVET output document (written from an objective “third party perspective”, not a proponent perspective – e.g., not referring to methods as “improved”, “optimized”, “enhanced”, etc.). The experiment descriptions should generally not express opinions or suggest conclusions – rather, they should just describe what technology will be tested, how it will be tested, who will participate, etc. Responsibilities for contributions to CE work should identify individuals in addition to company names.

CE descriptions contain a basic description of the technology under test, but should not contain excessively verbose descriptions of a technology (at least not unless the technology is not adequately documented elsewhere). Instead, the CE descriptions should refer to the relevant proposal contributions for any necessary further detail. However, the complete detail of what technology will be tested must be available – either in the CE description itself or in documents that are referenced in the CE description that are also available in the JVET document archive.

Any technology must have at least one cross-check partner to establish a CE – a single proponent is not enough. It is highly desirable have more than just one proponent and one cross-checker.

The CE development workflow was previously described at:

<https://vcgit.hhi.fraunhofer.de/jvet/VVCSoftware_VTM/wikis/Core-experiment-development-workflow>

However, it was noted that the link doesn’t seem to exist anymore.

CE read access is available using shared accounts: One account exists for MPEG members, which uses the usual MPEG account data. A second account exists for VCEG members with account information available in the TIES informal ftp area (IFA) system at:

<https://www.itu.int/ifa/t/2017/sg16/exchange/wp3/q06/vceg_account.txt>

Some agreements relating to CE activities were established as follows:

* Only qualified JVET members can participate in a CE.
* Participation in a CE is possible without a commitment of submitting an input document to the next meeting. Participation was requested by contacting the CE coordinator.
* All software, results, and documents produced in the CE should be announced and made available to JVET in a timely manner.
* A JVET CE reflector will be established and announced on the main JVET reflector. Discussion of logistics arrangements, exchange of data, minor refinement of the test plans, and preparation of documents shall be conducted on the JVET CE reflector, with subject lines prefixed by “[CEx: ]”, where “x” is the number of the CE. All substantial communications about a CE other than such details shall take place on main JVET reflector. In the case that large amounts of data are to be distributed, it is recommended to send a link to the data rather than the data itself, or upload the data as an input contribution to the next meeting.

General timeline for CEs

T1= 3 weeks after the JVET meeting: To revise the CE description and refine questions to be answered. Questions should be discussed and agreed on JVET reflector. Any changes of planned tests after this time need to be announced and discussed on the JVET reflector. Initially assigned description numbers shall not be changed later. If a test is skipped, it is to be marked as “withdrawn”.

T2 = Test model software release + 2 weeks: Integration of all tools into a separate CE branch of the VTM is completed and announced to JVET reflector.

* Initial study by cross-checkers can begin.
* Proponents may continue to modify the software in this branch until T3.
* 3rd parties are encouraged to study and make contributions to the next meeting with proposed changes

T3: 3 weeks before the next JVET meeting or T2 + 1 week, whichever is later: Any changes to the CE test branches of the software must be frozen, so the cross-checkers can know exactly what they are cross-checking. A software version tag should be created at this time. The name of the cross-checkers and list of specific tests for each tool under study in the CE plan description shall be documented in an updated CE description by this time.

T4: Regular document deadline minus 1 week: CE contribution documents including specification text and complete test results shall be uploaded to the JVET document repository (particularly for proposals targeting to be promoted to the draft standard at the next meeting).

The CE summary reports shall be available by the regular contribution deadline. This shall include documentation about crosscheck of software, matching of CE description and confirmation of the appropriateness of the text change, as well as sufficient crosscheck results to create evidence about correctness (crosscheckers must send this information to the CE coordinator at least 3 days ahead of the document deadline). Furthermore, any deviations from the timelines above shall be documented. The numbers used in the summary report shall not be changed relative to the description document.

CE reports may contain additional information about tests of straightforward combinations of the identified technologies. Such supplemental testing needs to be clearly identified in the report if it was not part of the CE plan.

New branches may be created which combine two or more tools included in the CE document or the VTM (as applicable).

It is not necessary to formally name cross-checkers in the initial version of the CE description document. To adopt a proposed feature at the next meeting, JVET would like to see comprehensive cross-checking done, with analysis of whether the description matches the software, and a recommendation of the value of the tool and given tradeoffs.

The establishment of a CE does not indicate that a proposed technology is mature for adoption or that the testing conducted in the CE is fully adequate for assessing the merits of the technology, and a favourable outcome of CE does not indicate a need for adoption of the technology into a standard or test model.

Availability of specification text is important to have a detailed understanding of the technology and also to judge what its impact on the complexity of the specification will be. There must also be sufficient time to study this in detail. CE contributions without sufficiently mature draft specification text in the CE input document should not be considered for adoption.

Lists of participants in CE documents should be pruned to include only the active participants. Read access to software will be available to all members.

# Establishment of ad hoc groups

The ad hoc groups established to progress work on particular subject areas until the next meeting are described in the table below. The discussion list for all of these ad hoc groups was agreed to be the main JVET reflector (jvet@lists.rwth-aachen.de).

Chairs of AHGs were asked to send draft mandates to JRO before 1200 on 4 Apr., preferably copy from the table below and sending with changemarks or yellow highlight of changes.

Review of AHG plans was conducted during the plenary on XXday X July 2025 at XXXX–XXXX.

|  |  |  |
| --- | --- | --- |
| **Title and Email Reflector** | **Chairs** | **Mtg** |
| **Project Management (AHG1)**(jvet@lists.rwth-aachen.de)* Coordinate overall JVET interim efforts.
* Supervise AHG and experiment studies.
* Report on project status to JVET reflector.
* Provide a report to the next meeting on project coordination status.
* Supervise processing and delivery of output documents
 | J.-R. Ohm (chair), G. J. Sullivan (vice‑chair) | N |
| **Draft text and test model algorithm description editing (AHG2)**(jvet@lists.rwth-aachen.de)* Produce and finalize draft text outputs of the meeting (JVET-AL1006, JVET-AL1017, JVET-AL2005 and JVET-AL2006).
* Collect reports of errata for the VVC, VSEI, HEVC, AVC, CICP, and the published related technical reports and produce the JVET-AL1004 errata output collection.
* Coordinate with the test model software development AhG to address issues relating to mismatches between software and text.
* Collect and consider errata reports on the texts.
 | B. Bross, C. Rosewarne (co-chairs), F. Bossen, A. Browne, S. Kim, S. Liu, J.‑R. Ohm, G. J. Sullivan, A. Tourapis, Y.-K. Wang, Y. Ye (vice‑chairs) | N |
| **Test model software development (AHG3)**(jvet@lists.rwth-aachen.de)* Coordinate development of test models (VTM, HM, SCM, SHM, HTM, MFC, MFCD, JM, JSVM, JMVM, 3DV-ATM, 360Lib, and HDRTools) software and associated configuration files.
* Produce documentation of software usage for distribution with the software.
* Enable software support for recently standardized additional SEI messages (for both VTM and HM), and SEI messages in TuC (the latter in a separate branch of VTM).
* Discuss and make recommendations on the software development process.
* Perform comparative tests of test model behaviour using common test conditions, including HDR, high bit depth and high bit rate.
* Suggest configuration files for additional testing of tools.
* Investigate how to minimize the number of separate codebases maintained for group reference software.
* Coordinate with AHG on Draft text and test model algorithm description editing (AHG2) to identify any mismatches between software and text, and make further updates and cleanups to the software as appropriate.
* Prepare drafts of merged and updated CTC documents for HM and VTM, as applicable.
 | F. Bossen, X. Li, K. Sühring (co-chairs), E. François, Y. He, K. Sharman, V. Seregin, A. Tourapis (vice‑chairs) | N |
| **Test material and visual assessment (AHG4)** (jvet@lists.rwth-aachen.de)* Consider plans for additional verification testing of VVC capability, particularly target conducting tests for VVC multi-layer features, and update the test plan accordingly.
* Maintain the video sequence test material database for testing the VVC and HEVC standards and potential future extensions, as well as exploration activities.
* Study coding performance and characteristics of available and proposed video test material.
* Identify and recommend appropriate test material for testing the VVC standard and potential future extensions, as well as exploration activities.
* Identify and characterize missing types of video material, solicit contributions, collect, and make available a variety of video sequence test material, in coordination with other AHGs, as appropriate.
* Maintain and update the directory structure for the test sequence repository, as necessary.
* Collect information about test sequences that have been made available by other organizations.
* Prepare and conduct expert viewing for purposes of subjective quality evaluation.
* Coordinate with AG 5 in studying and developing further methods of subjective quality evaluation, e.g. based on crowd sourcing, as well as studying objective metrics in that context.
* Coordinate with AHG17 on investigating sequences and making arrangements for viewing at the next meeting.
* Coordinate with AHG18 on investigating visual impact of data losses.
* Prepare availability of viewing equipment and facilities arrangements for future meetings.
 | V. Baroncini, T. Suzuki, M. Wien (co-chairs), W. Husak, S. Iwamura, P. de Lagrange, S. Liu, X. Meng, S. Puri, A. Segall, S. Wenger (vice-chairs) | Y (tel., 2 weeks notice) on multi-layer testing |
| **Conformance testing (AHG5)**(jvet@lists.rwth-aachen.de)* Study CD of VVC conformance 3rd edition and suggest improvements to JVET-AK2028, as appropriate.
* Study the draft conformance bitstreams for new HEVC multiview profiles in JVET-AI1008, and further develop related conformance bitstreams.
* Coordinate with AHG3 on implementation of the new HEVC multiview profiles.
* Study the requirements of VVC, HEVC, and AVC conformance testing to ensure interoperability.
* Maintain and update the conformance bitstream database, and contribute to report problems, and suggest actions to resolve these.
* Study additional testing methodologies to fulfil the needs for VVC conformance testing.
 | I. Moccagatta (chair), F. Bossen, T. Ikai, S. Iwamura, H.-J. Jhu, K. Kawamura, P. de Lagrange, S. Paluri, K. Sühring, Y. Yu (vice‑chairs) | N |
| **ECM software development (AHG6)**(jvet@lists.rwth-aachen.de)* Coordinate development of the ECM software and associated configuration files.
* Produce documentation of software usage for distribution with the software.
* Prepare and deliver ECM-17.0 software version (and potential updates), corresponding VTM anchor, and the reference configuration encodings according to the ECM common test conditions.
* Investigate encoder speedup and other software optimization such as reduction of memory consumption.
* Coordinate with ECM algorithm description editors to identify any mismatches between software and text, make further updates and cleanups to the software as appropriate.
 | V. Seregin (chair), J. Chen, R. Chernyak, F. Le Léannec, K. Zhang (vice-chairs) | N |
| **ECM tool assessment (AHG7)**(jvet@lists.rwth-aachen.de)* Investigate methodology of tool assessment, such as the aspects of memory access and bandwidth, number of maximum processing cycles, block decoding dependencies, number of context coded bins, pipeline and parallelization.
* Coordinate with AHG6 on resolving tool-off test related software issues (missing tool controls and software bugs).
* Prepare configuration files and generate bitstreams and results of tool-on/tool-off testing.
* Prepare reporting of tool assessment results.
* Coordinate with AHG17 to collect simulation results on non-CTC sequences (e.g., those used in previous verification tests), and identify a set of non-CTC sequences that would be appropriate for additional testing.
* Develop methodology of more reliable runtime measurement.
 | X. Li (chair), L.-F. Chen, Z. Deng, J. Gan, E. François, R. Ishimoto, H.-J. Jhu, J. Lainema, X. Li, J. Pardo, A. Stein, H. Wang (vice‑chairs) | Y (tel., 2 weeks notice) |
| **Optimization of encoders and receiving systems for machine analysis of coded video content (AHG8)**(jvet@lists.rwth-aachen.de)* Solicit and study non-normative encoder and receiving systems technologies that enhance performance of machine analysis tasks on coded video content.
* Identify and collect test materials that are suitable to be used by JVET for machine analysis tasks.
* Discuss improvements on the evaluation framework, including evaluation procedures and methodologies.
* Coordinate software development and experiments on optimization of encoders and receiving systems for machine analysis of coded video content, including combinations of proposed technologies.
* Maintain the software implementation examples and develop tool combination examples in the repository, including sufficient documentation in terms of operation and performance.
* Evaluate proposed technologies and their suitability for machine analysis applications.
* Propose improvements to JVET-AL2030 on optimization of encoders and receiving systems for machine analysis of coded video content.
* Study the potential of using SEI messages for the purpose of machine analysis in coordination with AHG9.
* Investigate the impact of using different machine task models in the evaluation of the compression performance of tools optimized for machine analysis tasks.
 | S. Liu, J. Ström, S. Wang, M. Zhou (AHG chairs) | N |
| **SEI message studies (AHG9)**(jvet@lists.rwth-aachen.de)* Study the SEI messages in VSEI, VVC, HEVC and AVC.
* Study JVET-AL1006, JVET-AL1017, JVET-AL2005, and JVET-AL2006, identify any issues and propose solutions as appropriate.
* Study JVET-AL2032, and propose improvements.
* Collect software and showcase information for SEI messages, including encoder and decoder implementations and bitstreams for demonstration and testing.
* Identify potential needs for additional SEI messages.
* Study SEI messages specified in HEVC and AVC for potential use in the VVC context and SEI messages in VSEI for potential use in the HEVC or AVC context.
* Study the alignment of the same SEI messages in different standards.
* Coordinate with AHG3 for software support of SEI messages for JM, HM, and VTM.
 | S. McCarthy, J. Boyce, Y.-K. Wang (co-chairs), T. Chujoh, S. Deshpande, M. M. Hannuksela, P. de Lagrange, G. J. Sullivan, H. Tan, A. Tourapis, S. Wenger, P. Wu (vice-chairs) | N |
| **Encoding algorithm optimization (AHG10)**(jvet@lists.rwth-aachen.de)* Study the impact of using techniques such as tool adaptation and configuration, and perceptually optimized adaptive quantization for encoder optimization.
* Study the impact of non-normative techniques of preprocessing for the benefit of encoder optimization.
* Study encoding techniques of optimization for objective quality metrics and their relationship to subjective quality.
* Study optimized encoding for reference picture resampling and scalability modes in VTM, and coordinate with AHG4 on improving encoders and test settings for multi-layer verification testing.
* Study optimized encoding and suitable test settings for noisy materials, such as sequences containing film grain.
* Study optimized encoding and tool combinations for low latency and for low complexity.
* Consider neural network-based encoding optimization technologies for video coding standards.
* Investigate other methods of improving objective and/or subjective quality, including adaptive coding structures and multi-pass encoding.
* Study methods of rate control and rate-distortion optimization and their impact on performance, subjective and objective quality.
* Study the potential of defining default or alternate software configuration settings and test conditions optimized for either subjective quality, higher objective quality, or encoding with improved complexity/performance tradeoff, and coordinate such efforts with AHG3, AHG6, and AHG17.
* Study the effect of varying configuration parameters depending on temporal layer, such as those related to deblocking, partitioning, chroma QP.
 | K. Andersson, P. de Lagrange, A. Duenas (co-chairs), T. Ikai, T. Solovyev, A. Tourapis (vice chairs) | N |
| **Neural network-based video coding (AHG11)** (jvet@lists.rwth-aachen.de)* Evaluate and quantify the performance improvement potential of NN-based video coding technologies compared to existing video coding standards such as VVC, including both individual coding tools, architectures and content adaptation with NN parameters overfitting.
* Establish logistics of training data sets, including list, location and md5sums. Generate and distribute anchor encoding, and develop supporting software as needed.
* Study potential improvements of the NNVC CTC document JVET-AJ2016.
* Study the impact of training (including the impact of loss functions) on the performance of candidate technologies and identify suitable material for testing and training.
* Analyse complexity characteristics for technologies under study, including transformers, perform complexity analysis, and develop complexity reductions of candidate technology.
* Discuss and propose improved metrics to perform complexity analysis of NN architectures, in particular also investigate bit-exact reproducibility of NN-based methods on various platforms.
* Finalize and discuss the EE on neural network-based video coding.
* Promote the call for training materials, distribute it, and actively communicate with content owners.
* Coordinate with other groups, including SC 29/AG 5 on the evaluation and assessment of visual quality, and AHG12 on the interaction with ECM coding tools. If possible, prepare encodings with combinations of tools included in the NNVC software for visual quality assessment at the next meeting.
* Coordinate with AHG14 on items related to NNVC software development and development of an interface to NNVC software branch allowing to perform evaluation tests for end-to-end optimized AI coded reference pictures.
 | E. Alshina, F. Galpin, S. Liu, A. Segall (co-chairs), J. Li, Y. Li, R.-L. Liao, M. Santamaria, T. Shao, M. Wien, P. Wu (vice chairs) | Y (tel., 2 weeks notice), first on April 25, second on May 23 |
| **Enhanced compression beyond VVC capability (AHG12)**(jvet@lists.rwth-aachen.de)* Solicit and study non-neural-network video coding tools with enhanced compression capabilities beyond VVC.
* Discuss and propose refinements to the ECM17 algorithm description JVET-AL2025.
* Coordinate with AHG7 to study the performance and complexity tradeoff of these video coding tools.
* Coordinate with AHG6 on ECM software development.
* Support AHG6 in generating anchors according to the test conditions in JVET-AI2017.
* Analyse the results of exploration experiments described in JVET-AL2024 in coordination with the EE coordinators.
* Coordinate with AHG11 to study the interaction with neural network-based coding tools.
 | M. Karczewicz, Y. Ye, L. Zhang (co-chairs), B. Bross, R. Chernyak, X. Li, K. Naser, Y. Yu (vice-chairs) | N |
| **Film grain technologies (AHG13)**(jvet@lists.rwth-aachen.de)* Study the benefits and characteristics of film grain technologies, including autoregressive and frequency-filtering technologies.
* Discuss and propose refinements to the draft of the TR 2nd ed. JVET-AL2020.
* Study alternative film grain models and their associated documentation.
* Discuss and enumerate updates, improvements, and additions for the second edition of the technical report.
* In consultation with AHG4, study and define content characteristics and test conditions that are desirable for the study and testing of film grain technologies, and perform an assessment of newly available test materials in that regard.
* Investigate metrics for measuring film grain fidelity in itself, or as present in a video.
* Discuss the potential need for film grain conformance guidelines.
* Given the study of desirable content characteristics, solicit or create new test material for further determining the operational characteristics of, testing, and developing any related technologies.
* Study preprocessing and encoder technologies for determining values for FGC (Film Grain Characteristics) SEI message syntax elements.
* Identify potential need for additional film grain technology and signalling, if needed.
* Coordinate development of film grain technology software and configuration files.
* Coordinate with AG 5 on improving the plan for subjective quality testing of the FGC SEI message JVET-AJ2022, and conduct preparations for such testing.
* Coordinate with AHG3 for software support of the FGC SEI message.
 | W. Husak, P. de Lagrange (co-chairs), A. Duenas, X. Meng, M. Radosavljević, A. Segall, G. Teniou, A. Tourapis (vice-chairs) | Y (tel., 2 weeks notice) |
| **NNVC software development (AHG14)**(jvet@lists.rwth-aachen.de)* Coordinate development of the NNVC software and associated configuration files.
* Prepare and deliver NNVC-13.0 software version (and potential updates), and provide reference configuration encodings according to the NNVC common test conditions as described in JVET-AJ2016. Study the impact of the addition of new dataset on the already integrated models.
* Investigate and bridge coding performance of NNVC VTM anchor compared to the latest VTM version and/or VTM anchor in ECM software.
* Investigate combinations of tools included in the NNVC software, prepare and release anchor data for all configurations of the software, including anchors for High and Low Operation Point (HOP/LOP) and Very Low Operation Point (VLOP) configurations.
* Study and maintain the SADL (Small Adhoc Deep-Learning Library). Identify gaps in functionality and develop improvements as needed.
* Coordinate with NNVC algorithm and software description (JVET-AL2019) editors to identify any mismatches between software and description document, suggest further updates to the description document as appropriate.
* Coordinate with AHG11 on items related to NNVC software development, and development of an interface to NNVC software branch allowing to perform evaluation tests for end-to-end optimized AI coded reference pictures.
 | F. Galpin (chair), R. Chang, Yue Li, Yun Li, M. Santamaria, J. N. Shingala, Z. Xie (vice chairs) | Y (tel., 2 weeks notice), first on April 25, second on May 23 |
| **Gaming content compression (AHG15)** (jvet@lists.rwth-aachen.de)* Identify gaming content application scenarios and their requirements for codec operation.
* Identify and characterize required types of content; solicit contributions, collect, and make a variety of gaming content available, in coordination with AHG4 and AG 5.
* Produce VTM and ECM anchor encodings according to CTC JVET-AJ2027, and provide test results at the next meeting.
* Develop and maintain interfaces for supporting use cases of camera parameters and depth maps in gaming applications, including mechanisms for efficient transporting these elements in the coded video bitstream.
* Evaluate JVET test models (such as ECM, VTM, NNVC, etc.) under the proposed test conditions.
* Investigate possibilities to enhance compression capability for gaming content.
* Study conversion of depth maps using integer representation, and identifying efficient bit-depth resolution of depth maps to support identified use-cases that will be an input to compression.
* Solicit contributions from industry on typical bitrate/quality/resolution used for gaming content compression.
 | S. Puri, J. Sauer (co-chairs), R. Chernyak, A. Duenas, L. Wang, V. Zakharchenko (vice chairs) | N |
| **Generative face video compression (AHG16)**(jvet@lists.rwth-aachen.de)* Maintain GFVC software tools, associated configuration files, and software usage documentation.
* Study the extension of GFVC software capability to handle video content with higher resolutions.
* Identify and study additional test content, including content with higher resolutions, suitable for use in GFVC performance evaluation.
* Study GFVC performance under test conditions defined in JVET-AJ2035, as well as performance on additional test content, and wider bitrate ranges.
* Coordinate with AHG9 on further development of the GFV and GFVE SEI messages in JVET-AL2006.
 | Y. Ye (chair), H.-B. Teo, Z. Lyu, S. McCarthy, S. Wang (vice chairs) | N |
| **Testing of video coding technology beyond CTC (AHG17)**(jvet@lists.rwth-aachen.de)* Finalize the draft CfE JVET-AL2026.
* Prepare encoded bitstreams for the test sequences and encoder configurations defined in the draft CfE .
* Make preparations for subjective viewing in dry-run of CfE at the next meeting.
 | J.-R. Ohm, M. Wien (co-chairs), M. Abdoli, E. Alshina, V. Baroncini, J. Chen, R. Chernyak, Z. Deng, P. de Lagrange, L. Li, D. Rusanovskyy (vice chairs) | Y * tel., 2 weeks notice, first on April 15, 14 UTC
 |
| **Ultra-low latency and packet loss resilience (AHG18)**(jvet@lists.rwth-aachen.de)* Investigate and identify test conditions, evaluation criteria and evaluation methodology, supporting a set of end-to-end latency targets in a range of 25-100 ms.
* Investigate creation of practical simulation software based on VTM, including network transmission aspects, and conduct performance evaluation.
* Identify potential requirements and feasibility of standard based technologies to support ultra-low delay requirements, including packet loss resilient decoding.
* Investigate packet loss resilient technologies beyond VVC supporting ultra-low delay coding for interactive and live broadcasting scenarios.
* Coordinate with AHG4 on investigating visual impact of data losses.
 | S. Ikonin, S. Wenger, V. Zakharchenko (co-chairs), S. Deshpande, S. Fößel, C. Kim, X. Ma, S. Puri, J. Ström (vice-chairs) | Y (tel., 2 weeks notice) |

It was confirmed that the rules which can be found in document ISO/IEC JTC 1/‌SC 29/‌AG 2 [N 046](https://www.mpegstandards.org/wp-content/uploads/2022/01/ISO-IECJTC1-SC29-AG2_N0046_AhG.pdf) “Ad hoc group rules for MPEG AGs and WGs” (available at <https://www.mpegstandards.org/adhoc/>), are consistent with the operation mode of JVET AHGs. It is pointed out that JVET does not maintain separate AHG reflectors, such that any JVET member is implicitly a member of any AHG. This shall be mentioned in the related WG Recommendations. The list above was also issued as a separate WG 5 document (ISO/IEC JTC 1/‌SC 29/‌WG 5 N 357) in order to make it easy to reference.

# Output documents (update)

The following documents were agreed to be produced or endorsed as outputs of the meeting. Names recorded below indicate the editors responsible for the document production. Where applicable, dates of planned finalization and corresponding parent-body document numbers are also noted.

It was reminded that in cases where the JVET document is also made available as a WG 5 output document, a separate version under the WG 5 document header should be generated. This version should be sent to GJS and JRO for upload.

The list of JVET ad hoc groups was also issued as a WG 5 output document WG 5 N 357, as noted in section 9.

[JVET-AL1000](https://jvet-experts.org/doc_end_user/current_document.php?id=15673) Meeting Report of the 38th JVET Meeting [J.-R. Ohm] [WG 5 N 344] (2025-05-02)

Initial versions of the meeting notes (d0 … d9) were made available on a daily basis during the meeting.

Remains valid – not updated: [JVET-AC1001](https://jvet-experts.org/doc_end_user/current_document.php?id=12566) Guidelines for HM-based software development [K. Sühring, F. Bossen, X. Li (software coordinators)]

Remains valid – not updated: [JVET-Y1002](https://jvet-experts.org/doc_end_user/current_document.php?id=11463) High Efficiency Video Coding (HEVC) Test Model 16 (HM 16) Encoder Description Update 16 [C. Rosewarne (primary editor), K. Sharman, R. Sjöberg, G. J. Sullivan (co-editors)] [WG 5 [N 103](https://dms.mpeg.expert/doc_end_user/current_document.php?id=82085&id_meeting=189)]

Remains valid – not updated: [JVET-AH1003](https://jvet-experts.org/doc_end_user/current_document.php?id=14259) Coding-independent code points for video signal type identification (Draft 3) [G. J. Sullivan, A. Tourapis]

Primary editor: G. J. Sullivan.

[JVET-AL1004](https://jvet-experts.org/doc_end_user/current_document.php?id=15674) Errata report items for VVC, VSEI, HEVC, AVC, and Video CICP [Y.-K. Wang, B. Bross, I. Moccagatta, C. Rosewarne, G. J. Sullivan] (2025-05-31, near next meeting)

Primary editor: Y.-K. Wang.

This includes changes from new bug tickets, some items removed that are resolved and include elements from JVET-AL0317.

Remains valid – not updated: [JVET-AH1005](https://jvet-experts.org/doc_end_user/current_document.php?id=14261) Technology under consideration for future editions of CICP [E. Thomas, A. Tourapis] [WG 5 N 289)]

From new activities and contributions kept for further study, updates expected in future meetings.

[JVET-AL1006](https://jvet-experts.org/doc_end_user/current_document.php?id=15675) HEVC additional profiles and SEI messages (Draft 3) [Y.-K. Wang, B. Bross, S. Deshpande, G. J. Sullivan, A. Tourapis] [WG 5 DAM N 349)] (2025-04-18)

Primary editor: Y.-K. Wang.

A DoC WG 5 N 348 on the CDAM was reviewed and approved on Friday 04 April at 0550-0600.

Changes agreed at this meeting:

* JVET-AL0059 AHG9: Inclusion of the packed regions information SEI message in HEVC
* JVET-AL0061 AHG 9: Encoder optimization information for AVC and HEVC
* JVET-AL0062 AHG 9: AI usage restrictions SEI message for AVC and HEVC
* JVET-AL0148 AHG9: Generative face video and generative face video enhancement SEI messages for HEVC and AVC
* JVET-AL0210 AHG9: On SEI processing order SEI message for HEVC and AVC
* JVET-AL0223 Corrections and clarifications for profile-related aspects of the draft text of HEVC
* JVET-AL0339 Merged text of JVET-AL0086 and JVET-AL0204 for the FGC SEI message

It is noted that the list above may not be complete; if some adoption is missing that is recorded somewhere else in the meeting notes it shall also be considered included.

Remains valid – not updated: [JCTVC-V1007](https://mpeg.expert/jct/files/JCTVC-V1007-v1.zip) SHVC Test Model 11 (SHM 11) Introduction and Encoder Description [G. Barroux, J. Boyce, J. Chen, M. M. Hannuksela, Y. Ye] [WG 11 N 15778]

Remains valid – not updated: [JVET-AI1008](https://jvet-experts.org/doc_end_user/current_document.php?id=14609) Conformance testing for HEVC multiview extended and monochrome profiles [I. Moccagatta, S. Paluri, A. Tourapis, Y.-K. Wang]

Y.-K. Wang to be replaced by T. Fu in the next version.

Remains valid – not updated: [JVET-AC1009](https://jvet-experts.org/doc_end_user/current_document.php?id=12569) Common test conditions for SHVC [K. Sühring]

Links to test sequences need to be updated due to the change of the content server.

Remains valid – not updated: [JCTVC-O1010](https://mpeg.expert/jct/files/JCTVC-O1010-v1.zip) Guidelines for Conformance Testing Bitstream Preparation [T. Suzuki, W. Wan]

Remains valid – not updated: [JVET-AJ1011](https://jvet-experts.org/doc_end_user/current_document.php?id=14991) White paper on HEVC [B. Bross, J.-R. Ohm, G. J. Sullivan, Y.-K. Wang] [AG 3 N 174]

Remains valid – not updated: JVET-[AJ1012](https://jvet-experts.org/doc_end_user/current_document.php?id=14992) Overview of IT systems used in JVET [J.-R. Ohm, I. Moccagatta, K. Sühring, M. Wien]

Update of bug tracking system description expected in next meeting.

Remains valid – not updated: [JCT3V-G1003](https://mpeg.expert/jct3v/files/JCT3V-G1003-v2.zip) 3D-AVC Test Model 9 [D. Rusanovskyy, F. C. Chen, L. Zhang, T. Suzuki] [WG 11 N 14239]

Remains valid – not updated: [JCT3V-K1003](https://mpeg.expert/jct3v/files/JCT3V-K1003-v1.zip) Test Model 11 of 3D-HEVC and MV-HEVC [Y. Chen, G. Tech, K. Wegner, S. Yea] [WG 11 N 15141]

Remains valid – not updated: [JVET-AE1013](https://jvet-experts.org/doc_end_user/current_document.php?id=13268) Common test conditions of 3DV experiments [K. Sühring, M. Wien]

Links to test sequences need to be updated due to the change of the content server.

Remains valid – not updated [JCTVC-V1014](https://mpeg.expert/jct/files/JCTVC-V1014-v1.zip) Screen Content Coding Test Model 7 Encoder Description (SCM 7) [R. Joshi, J. Xu, R. Cohen, S. Liu, Y. Ye] [WG 11 N 16049]

Remains valid – not updated: [JVET-AC1015](https://jvet-experts.org/doc_end_user/current_document.php?id=12571) Common test conditions for SCM-based screen content coding [K. Sühring]

Links to test sequences need to be updated due to the change of the content server.

Remains valid – not updated: [JVET-AH1016](https://jvet-experts.org/doc_end_user/current_document.php?id=14264) AVC with extensions and corrections (draft 3) [B. Bross, T. Ikai, G. J. Sullivan, A. Tourapis, Y.-K. Wang]

Primary editor: B. Bross.

[JVET-AL1017](https://jvet-experts.org/doc_end_user/current_document.php?id=15676) Support for additional SEI messages in AVC (Draft 2) [B. Bross, J. Boyce, G. J. Sullivan, Y.-K. Wang] [WG 5 CDAM N 345] (2025-04-18)

Primary editor: B. Bross

Changes agreed at this meeting:

* JVET-AL0061 AHG 9: Encoder optimization information for AVC and HEVC
* JVET-AL0062 AHG 9: AI usage restrictions SEI message for AVC and HEVC
* JVET-AL0148 AHG9: Generative face video and generative face video enhancement SEI messages for HEVC and AVC
* JVET-AL0210 AHG9: On SEI processing order SEI message for HEVC and AVC

Resolved bug fixes carried over from JVET-AK1004 were also to be included.

It is noted that the list above may not be complete; if some adoption is missing that is recorded somewhere else in the meeting notes it shall also be considered included.

[JVET-AL1018](https://jvet-experts.org/doc_end_user/current_document.php?id=15677) HEVC with extensions and corrections (Draft 1) [G. J. Sullivan, Y.-K. Wang] (2025-06-15)

Primary editor: Y.-K. Wang.

To prepare the next edition of H.265 – developed from JVET-AL0223, in particular regarding the editorial updates on profiles. Other changes made in the differential text JVET-AL1006 (e.g., new SEI messages) not yet included.

No output: JVET-Axx1019 through JVET-Axx1099

Remains valid – not updated [JVET-AA1100](https://jvet-experts.org/doc_end_user/current_document.php?id=11944) Common Test Conditions for HM Video Coding Experiments [K. Sühring, K. Sharman]

This specifies only the CTC for non-4:2:0 colour formats. The corresponding document for VVC is JVET-T2013, with no unification yet.

Links to test sequences need to be updated due to the change of the content server.

No output: JVET-Axx2001

Remains valid – not updated: [JVET-AH2002](https://jvet-experts.org/doc_end_user/current_document.php?id=14265) Algorithm description for Versatile Video Coding and Test Model 22 (VTM 22) [Y. Ye, A. Browne, S. Kim] [WG 5 N 284]

Primary editor: Y. Ye.

New elements from notes elsewhere in this report (kept for future use):

* …

It is noted that the list above may not be complete; if some adoption is missing that is recorded somewhere else in the meeting notes it shall also be considered included.

It was suggested that editorial improvements submitted as input to the next meeting would be welcome.

Remains valid – not updated: [JVET-AJ2003](https://jvet-experts.org/doc_end_user/current_document.php?id=14993) Guidelines for VTM-based software development [F. Bossen, X. Li, K. Sühring]

Remains valid – not updated: [JVET-T2004](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=10542) Algorithm descriptions of projection format conversion and video quality metrics in 360Lib (Version 12) [Y. Ye, J. Boyce]

[JVET-AL2005](https://jvet-experts.org/doc_end_user/current_document.php?id=15678) Additions and corrections for VVC version 4 (Draft 12) [G. J. Sullivan, B. Bross, M. M. Hannuksela, Y.-K. Wang] [WG 5 DAM N 351)] (2025-04-18)

A DoC WG 5 N 350 on the CDAM was reviewed and approved on Friday 04 April at 0505-0520.

Changes agreed at this meeting:

* JVET-AL0056 AHG9: On the encoder optimization information SEI message
* JVET-AL0123 AHG9: On the encoder optimization information (EOI) SEI message
* JVET-AL0117 AHG9: On association of NAL units to DSC verification substreams
* JVET-AL0324 (incl. aspects of JVET-AL0072, JVET-AL0098, JVET-AL0120, JVET-AL0122, JVET-AL0129, JVET-AL0303) AHG9: A summary of proposals on the PRI SEI message
* JVET-AL0130 AHG9: Source picture timing for interlaced video with SPTI SEI message
* JVET-AL0339 Merged text of JVET-AL0086 and JVET-AL0204 for the FGC SEI message

It is noted that the list above may not be complete; if some adoption is missing that is recorded somewhere else in the meeting notes it shall also be considered included.

Primary editor: G. J. Sullivan.

[JVET-AL2006](https://jvet-experts.org/doc_end_user/current_document.php?id=15679) Additional SEI messages for VSEI version 4 (Draft 6) [J. Boyce, J. Chen, S. Deshpande, M. M. Hannuksela, S. McCarthy, G. J. Sullivan, H. Tan, Y.-K. Wang] [WG 5 DAM N 347)] (2025-04-18)

A DoC WG 5 N 346 on the CDAM was reviewed and approved on Friday 04 April at 0520-0550.

Changes agreed at this meeting:

* SPO
	+ JVET-AL0063 AHG9: On SPO SEI message
	+ JVET-AL0064 AHG9: On the SPO SEI message complexity signalling
	+ JVET-AL0208 AHG9: On SPO root-process signalling constraint
* NNPF
	+ JVET-AL0075 AHG9: On nnpfa\_num\_input\_pic\_shift
	+ JVET-AL0096 AHG9: On signalling of extension syntax elements in NNPFA SEI message
* EOI
	+ JVET-AL0056 AHG0: On the encoder optimization information SEI message
	+ JVET-AL0123 AHG9: On the encoder optimization information (EOI) SEI message
	+ JVET-AL0310 On signalling of resampling type for EOI SEI message
* OMI
	+ JVET-AL0066 AHG9: Lossy compression with Object mask info SEI
	+ JVET-AL0067 AHG9: On the OMI SEI
	+ JVET-AL0071 AHG9: On OMI SEI message
* GFV
	+ JVET-AL0155 AHG9: Further fixes and cleanup on GFV and GFVE SEI messages
* DSC
	+ JVET-AL0078 AHG9: On Digital Signing
	+ JVET-AL0103 AHG9: Editorial changes for the three DSC SEI messages
	+ JVET-AL0117 AHG9: On association of NAL units to DSC verification substreams
	+ JVET-AL0118 AHG9: Miscellaneous changes for the three DSC SEI messages
	+ JVET-AL0222 AHG9: On Digitally Signed Content SEI messages
	+ JVET-AL0327 AHG9: Handling of multiple DSC systems
* PRI
	+ JVET-AL0070 AHG9: On packed regions information SEI message
	+ JVET-AL0324 (incl. aspects of JVET-AL0072, JVET-AL0098, JVET-AL0120, JVET-AL0122, JVET-AL0129, JVET-AL0303) AHG9: A summary of proposals on the PRI SEI message
* IFM
	+ JVET-AL0068 AHG9: On image format metadata (IFM) SEI
	+ JVET-AL0094 AHG9: On payload length of image format metadata (IFM) SEI
	+ JVET-AL0128 AHG9: On image format metadata SEI message
* AUR
	+ JVET-AL0058 AHG9: On the AI usage restrictions SEI message
* TDI
	+ JVET-AL0077 AHG9: On the text description information SEI message
* SPTI
	+ JVET-AL0130 AHG9: Source picture timing for interlaced video with SPTI SEI message
* FGC
	+ JVET-AL0339 AHG9: Merged text of JVET-AL0086 and JVET-AL0204 for the FGC SEI message
* Multiple
	+ JVET-AL0132 AHG9: Editorial updates for VSEI v4
	+ JVET-AL0131 AHG9: Proposed changes for miscellaneous aspects of SEIs in VSEI v4
	+ JVET-AL0249 AHG9: Proposed modifications to VSEI to address national body comments
	+ JVET-AL0301 AHG9: VSEI specification changes to reference the 3rd edition of video CICP

It is noted that the list above may not be complete; if some adoption is missing that is recorded somewhere else in the meeting notes it shall also be considered included.

Primary editor: J. Boyce.

Remains valid – not updated: [JVET-AJ2007](https://jvet-experts.org/doc_end_user/current_document.php?id=14996) Guidelines for NNVC software development [F. Galpin, S. Eadie, L. Wang, Z. Xie, Y. Li]

Remains valid – not updated: [JVET-X2008](https://jvet-experts.org/doc_end_user/current_document.php?id=11228) Conformance testing for versatile video coding (Draft 7) [J. Boyce, F. Bossen, K. Kawamura, I. Moccagatta, W. Wan]

The document number was planned to be re-used for a 3rd edition in ITU , once that is submitted to ITU-T (could be in October 2025).

Remains valid – not updated: [JVET-AJ2009](https://jvet-experts.org/doc_end_user/current_document.php?id=14997) Reference software for versatile video coding 2nd edition (Draft 2) [F. Bossen, K. Sühring, X. Li] [WG 5 DIS N 322)]

Software relating to H.266.2 and ISO/IEC 23090-16 can be found at <https://vcgit.hhi.fraunhofer.de/jvet/VVCSoftware_VTM/-/tree/2nd-edition>.

Primary editor: F. Bossen.

[JVET-AL2010](https://jvet-experts.org/doc_end_user/current_document.php?id=15680) VTM and HM common test conditions and software reference configurations for SDR 4:2:0 10 bit video [F. Bossen, X. Li, V. Seregin, K. Sharman, K. Sühring] (2025-04-18)

Add alternative configuration from JVET-AL0055 and clarification about intra picture period (see discussion under JVET-AL0114). Also links to test sequences are updated due to the change of the content server.

Remains valid – not updated: [JVET-AC2011](https://jvet-experts.org/doc_end_user/current_document.php?id=12575) VTM and HM common test conditions and evaluation procedures for HDR/WCG video [A. Segall, E. François, W. Husak, S. Iwamura, D. Rusanovskyy]

Links to test sequences need to be updated due to the change of the content server.

Remains valid – not updated: [JVET-U2012](https://jvet-experts.org/doc_end_user/current_document.php?id=10681) JVET common test conditions and evaluation procedures for 360° video [Y. He, J. Boyce, K. Choi, J.-L. Lin]

Links to test sequences need to be updated due to the change of the content server.

Remains valid – not updated: [JVET-T2013](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=10546) VTM common test conditions and software reference configurations for non-4:2:0 colour formats [Y.-H. Chao, Y.-C. Sun, J. Xu, X. Xu]

Links to test sequences need to be updated due to the change of the content server.

Remains valid – not updated: [JVET-Q2014](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=9683) JVET common test conditions and software reference configurations for lossless, near lossless, and mixed lossy/lossless coding [T.-C. Ma, A. Nalci, T. Nguyen]

Links to test sequences need to be updated due to the change of the content server.

Remains valid – not updated: [JVET-Q2015](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=9684) JVET functionality confirmation test conditions for reference picture resampling [J. Luo, V. Seregin]

Links to test sequences need to be updated due to the change of the content server.

Remains valid – not updated: [JVET-AJ2016](https://jvet-experts.org/doc_end_user/current_document.php?id=14998) Common test conditions and evaluation procedures for neural network-based video coding technology [E. Alshina, F. Galpin, R.-L. Liao, S. Liu, A. Segall]

Remains valid – not updated: [JVET-AI2017](https://jvet-experts.org/doc_end_user/current_document.php?id=14615) Common test conditions and evaluation procedures for enhanced compression tool testing [M. Karczewicz, Y. Ye]

Links to test sequences need to be updated due to the change of the content server.

Remains valid – not updated: [JVET-AA2018](https://jvet-experts.org/doc_end_user/current_document.php?id=11949) Common test conditions for high bit depth and high bit rate video coding [A. Browne, T. Ikai, D. Rusanovskyy, X. Xiu, Y. Yu]

Links to test sequences need to be updated due to the change of the content server.

[JVET-AL2019](https://jvet-experts.org/doc_end_user/current_document.php?id=15681) Description of algorithms version 11 and software version 13 in neural network-based video coding (NNVC) [F. Galpin, Yue Li, Yun Li, D. Rusanovskyy, T. Shao, J. Ström, L. Wang] (2025-06-15)

New elements in text and software from notes elsewhere in this report:

* Decision: Adopt the architecture from JVET-AL0084, using the model parameters from cross-check JVET-AL0246. It was also requested to double-check the correctness of the LOP diagram to be used in JVET-AL2019.
* Decision: Adopt JVET-AL0169. Training script also should be submitted with the merge request.

It is noted that the list above may not be complete; if some adoption is missing that is recorded somewhere else in the meeting notes it shall also be considered included.

[JVET-AL2020](https://jvet-experts.org/doc_end_user/current_document.php?id=15682) Film grain synthesis technology for video applications ed. 2 (Draft 3) [W. Husak, P. de Lagrange, A. Norkin, A. Tourapis] (2025-06-15)

Draft 1 (the output of the last meeting) was submitted for ITU approval, only containing necessary bug fixes and clarifications on top of the TR already approved in ISO/IEC. This means that currently the ITU and ISO versions are slightly diverging. JVET-AK2020 contains some paragraphs only relevant for v2 of ISO (as those are already included in v1 of ITU), and other paragraphs adding additional aspects that would be relevant for v2 of both ISO and ITU. It is expected that by the time of finalization of v2, alignment of the twin text can be reached.

New elements from JVET-AL0282.

Remains valid – not updated: [JVET-AJ2021](https://jvet-experts.org/doc_end_user/current_document.php?id=15001) Verification test plan for VVC multilayer coding (update 5) [O. Chubach, P. de Lagrange, M. Wien]

Remains valid – not updated: [JVET-AJ2022](https://jvet-experts.org/doc_end_user/current_document.php?id=15002) Plan for subjective quality testing of the FGC SEI message (update 4) [P. de Lagrange, W. Husak, M. Radosavljević, M. Wien]

[JVET-AL2023](https://jvet-experts.org/doc_end_user/current_document.php?id=15671) Exploration experiment on neural network-based video coding (EE1) [E. Alshina, R. Chang, F. Galpin, Yue Li, Yun Li, M. Santamaria, T. Shao, J. Ström, Z. Xie (EE coordinators)] (2025-04-18)

An initial draft of this document was reviewed and approved at 0855-0910 on Friday 04 Apr.

This round of EE1 tests includes:

* *EE1-1: LOP in-loop filter*
	+ EE1-1.1 – Sample-based adaptive blending weight selection for LOP
	+ EE1-1.2 – Over-Parameterized LOP In-Loop Filter
	+ EE1-1.3 – Backbone Block Enhancement of LOP In-Loop Filter with Over-Parameterized Training and Variable Channels
	+ EE1-1.4 – Conditional loop-filter
* *EE1-2: VLOP in-loop filter*
	+ EE1-2.1 – Improved VLOP with Attention
	+ EE1-2.2 – Conditional loop-filter
* *EE1-3: NN-inter prediction*
	+ EE1-3.1 – RA/LDB Unified Reference Frame Synthesis for VVC Inter Coding
	+ EE1-3.2 – Deep Reference Frame Generation for Inter Prediction Enhancement
* *EE1-4: NN-based super-resolution*
	+ EE1-4.1 – Cross-component enhanced NNSR

[JVET-AL2024](https://jvet-experts.org/doc_end_user/current_document.php?id=15672) Exploration experiment on enhanced compression beyond VVC capability (EE2) [V. Seregin, D. Bugdayci Sansli, J. Chen, R. Chernyak, K. Naser, J. Ström, F. Wang, M. Winken, X. Xiu, K. Zhang (EE coordinators)] (2025-05-02)

An initial draft of this document was reviewed and approved at 1300-1310 on Friday 04 Apr.

This round of EE2 tests will include:

|  |
| --- |
| **1 Intra prediction** |
| 1.1 | TIMD fusion with neural network based intra prediction |
| 1.2a | TIMD fusion with block vector based prediction |
| 1.2b | BV merge list improvement |
| 1.2c | Test 1.2a + Test 1.2b |
| 1.3 | IntraTMP template type adaptation |
| 1.4 | Test 1.2c + Test 1.3 |
| 1.5 | Test 1.1 + Test 1.4 |
| 1.6a | Intra merge mode |
| 1.6b | Intra merge mode using another adjacency map. |
| 1.7a | Block prediction with cubic interpolation filter in TIMD |
| 1.7b | Template prediction with 6-tap interpolation filter in TIMD |
| 1.7c | Test 1.7a + Test 1.7b |
| 1.8 | Harmonization of SGPM-BV and LIC |
| 1.9 | Block vector-based intra mode derivation |
| 1.10a | Matrix-based position dependent intra prediction for GPM |
| 1.10b | Matrix-based position dependent intra prediction for CIIP |
| 1.10c | Matrix-based position dependent intra prediction for GPM/CIIP |
| 1.10d | Extension to regression GPM |
| **2 Inter prediction** |
| 2.1a | Chained candidates in AMVP list |
| 2.1b | Chained candidates in AMVP and merge lists |
| 2.2a | Regression-based GPM intra-inter blending weights derivation in original domain |
| 2.2b | Regression-based GPM intra-inter blending weights derivation in LMCS domain |
| 2.3 | Affine bilateral matching merge mode |
| **3 Transform and coefficients coding** |
| 3.1a | Predictive transform coefficient coding |
| 3.1b | Test 3.1a on very high bitrate (QP 2, 7, 12, 17) |
| 3.2 | Directional sign prediction |
| 3.3 | Third transform set selection for IntraNN |
| 3.4a | Reduced zero-out for NSPT kernels |
| 3.4b | Decreased number of NSPT kernels |
| 3.4c  | Test 3.4a + Test 3.4b |
| 3.5 | Test 3.3 + Test 3.4 |
| 3.6a | Modified binarization of bypass-coded TSRC |
| 3.6b | Modified priority of sig\_coeff\_flag context coding in TSRC |
| 3.6c | Test 3.6b with relaxed budget constraint |
| 3.6d | ECM anchor with no budget restraint |
| **4 In-loop filtering** |
| 4.1 | TALF with reconstructed samples |
| 4.2 | Reuse of ALF control information |
| 4.3 | On ALF-CCCM |
| 4.4 | NN-ILF integration with ALF |
| 4.5 | Improvement of the NN ILF in ALF |

[JVET-AL2025](https://jvet-experts.org/doc_end_user/current_document.php?id=15683) Algorithm description of Enhanced Compression Model 17 (ECM 17) [M. Coban, R.-L. Liao, K. Naser, J. Ström, L. Zhang] (2025-06-15)

New elements from notes elsewhere in this report:

*Partitioning*

* Decision: Adopt JVET-AL0143 test 1.1.c

*Intra prediction*

* Decision: Adopt JVET-AL0206 test 2.9
* Decision: Adopt JVET-AL0191 test 2.2d
* Decision: Adopt JVET-AL0126 test 2.3
* Decision: Adopt JVET-AL0188 test 2.5
* Decision: Adopt JVET-AL0125 Test 2.6c
* Decision: Adopt JVET-AL0108 Test 2.7

*Inter prediction*

* Decision: Adopt JVET-AL0160 test 3.1
* Decision: Adopt JVET-AL0157 test 3.3e
* Decision: Adopt JVET-AL0134 test 3.4a
* Decision: Adopt JVET-AL0079 test 3.5
* Decision: Adopt JVET-AL0214 test 3.6
* Decision: Adopt JVET-AL0161 test 3.7b
* Decision: Adopt JVET-AL0162 test 3.8a
* Decision: Adopt JVET-AL0081 test 3.9

*Transform and coefficient coding*

* Decision: Adopt JVET-AL0181 test 4.1
* Decision: Adopt JVET-AL0215 test 4.4c

*In-loop filtering*

* Decision: Adopt JVET-AL0153 test 5.1
* Decision: Adopt JVET-AL0142 test 5.2
* Decision: Adopt JVET-AL0135 test 5.3b
* Decision: Adopt JVET-AL0182 (TALF reference picture extensions)
* Decision(SW): Adopt JVET-AL0228 (NNLF interface) to ECM. Shall be disabled by default (via macro, or establishing a separate branch). Also include description of interface in JVET-AL2025.

It is noted that the list above may not be complete; if some adoption is missing that is recorded somewhere else in the meeting notes it shall also be considered included.

[**JVET-AL2026**](https://jvet-experts.org/doc_end_user/current_document.php?id=15684)**Draft Joint Call for Evidence on video compression with capability beyond VVC [J.-R. Ohm, M. Wien] [WG 5 N 355] (2025-04-15)**

Developed from JVET-AL0047v5 and JVET-AL0338, to be finalized in AHG17 telco (April 15).

Remains valid – not updated: [JVET-AJ2027](https://jvet-experts.org/doc_end_user/current_document.php?id=15005) Common test conditions for gaming applications [J. Sauer, R. Chernyak, S. Puri, S. Thiebaud]

[JVET-AL2028](https://jvet-experts.org/doc_end_user/current_document.php?id=15685) Additions and corrections for VVC conformance (draft 1) [S. Iwamura, P. de Lagrange, I. Moccagatta] (2025-05-02)

This is a delta change document, some aspects related to bitstream corrections and editorial notes to be removed. For CD, WG 5 N 352 to be issued integrating these new bitstreams in ISO style, and deliver the corrected and bitstreams together with the valid old bitstreams as an attachment (preferentially mid to end of June to have CD ballot results in October). The ISO secretariat needs to be informed to create a URL for the conformance bitstreams. This is formally not necessary for the CD ballot which could point to the ftp site that is used for conformance development, but might be useful to be requested as early as possible to later speed up the delivery of the DIS.

Remains valid – not updated: [JVET-AH2029](https://jvet-experts.org/doc_end_user/current_document.php?id=14274) Visual quality comparison of ECM/VTM encoding [V. Baroncini, J.-R. Ohm, M. Wien] [AG 5 N 118]

[JVET-AL2030](https://jvet-experts.org/doc_end_user/current_document.php?id=15686) Optimization of encoders and receiving systems for machine analysis of coded video content (Draft 9) [S. Liu, J. Chen, J. Ström] [WG 5 DTR N 354] (2025-05-02)

Primary editor: S. Liu.

A DoC WG 5 N 353 on the CDTR was reviewed and approved on Friday 04 April at 0600-0615.

Request for public availability to be done when ITU-T version is submitted.

The ISO secretariat needs to be informed to create a URL for the software, and the software attachment needs to be prepared and submitted. This shall include software supporting all combinations that are indicated as relevant in the list.

New elements from notes elsewhere in this report:

* Updates in table for tool combinations, see notes under JVET-AL0152

It is noted that the list above may not be complete; if some adoption is missing that is recorded somewhere else in the meeting notes it shall also be considered included.

Remains valid – not updated: [JVET-AI2031](https://jvet-experts.org/doc_end_user/current_document.php?id=14623) Common test conditions for optimization of encoders and receiving systems for machine analysis of coded video content [S. Liu, C. Hollmann]

[JVET-AL2032](https://jvet-experts.org/doc_end_user/current_document.php?id=15687) Technologies under consideration for future extensions of VSEI (version 8) [S. McCarthy, J. Boyce, J. Chen, S. Deshpande, M. M. Hannuksela, H. Tan, Y.-K. Wang] (2025-05-16)

New elements from notes elsewhere in this report:

* FGC
	+ JVET-AL0211 AHG9: Resolution nesting for FGC SEI message
* SPO
	+ JVET-AL0064 AHG9: On the SPO SEI message complexity signalling
* EOI
	+ JVET-AL0221 AHG9: EOI SEI message with luma range adaptation for machine analysis
* DSC
	+ JVET-AL0186 AHG9: Subpicture support for digitally signed content SEI messages
* Multiple
	+ JVET-AL0308 AHG9: On layer ID syntax elements in VSEI TuC
	+ JVET-AL0093 AHG 9: On value range for syntax elements coded as u(v)
* NNPF
	+ JVET-AL0175 AHG9: On Target Mastering Colour Volume Information in the NNPFC SEI message for Tone Mapping
	+ JVET-AL0209 AHG9: On providing robustness against layer dropping in multi-layer NNPF
* CR
	+ JVET-AL0095 AHG 9: On constituent rectangles SEI message
	+ JVET-AL0139 AHG9: On multilayer support for CR SEI
* DR
	+ JVET-AL0097 AHG 9: Gaussian blur filling method in display rectangles SEI message
	+ JVET-AL0099 AHG9: On design of display rectangles SEI message
	+ JVET-AL0138 VVC interface for Display Rectangles SEI
	+ JVET-AL0141 AHG9: Showcase on the implementation of display rectangles SEI
* MPI
	+ JVET-AL0091 AHG9: On the multiplane image information (MPII) SEI message
* LOC
	+ JVET-AL0216 [AHG9] Lens Optical Correction SEI – floating point parameters representation
* ECFI
	+ JVET-AL0302 Updates of the enhanced colour format information SEI message
* New
	+ JVET-AL0127 AHG9: Danmu information SEI message
	+ JVET-AL0219 AHG9: Colour mapping information SEI

It is noted that the list above may not be complete; if some adoption is missing that is recorded somewhere else in the meeting notes it shall also be considered included.

It was agreed that MPI is not further changed, and will be removed upon completion of a corresponding MIV profile.

Remains valid – not updated: [JVET-AF2033](https://jvet-experts.org/doc_end_user/current_document.php?id=13593) Report of verification test on VVC multi-layer coding: Content layering [S. Iwamura, P. de Lagrange, M. Wien] [AG 5 N 105)]

Remains valid – not updated: [JVET-AI2034](https://jvet-experts.org/doc_end_user/current_document.php?id=14624) Call for new HDR materials for future video coding development [E. François, W. Husak, S. Iwamura, D. Rusanovskyy, A. Segall, M. Wien] [WG 5 N 312)]

Remains valid – not updated: [JVET-AJ2035](https://jvet-experts.org/doc_end_user/current_document.php?id=15008) Test conditions and evaluation procedures for generative face video coding [S. McCarthy, B. Chen]

Remains valid – not updated: [JVET-AG2036](https://jvet-experts.org/doc_end_user/current_document.php?id=13921) Call for training materials for neural network-based video coding tool development [E. Alshina, F. Galpin, S. Liu, M. Wien] [WG 5 N 266)]

Remains valid – not updated: [JVET-AJ2037](https://jvet-experts.org/doc_end_user/current_document.php?id=15009) Report on subjective quality testing of the FGC SEI message (AG 5 N 140) [P. de Lagrange, W. Husak, M. Wien] [AG 5 N 140)] (2024-12-31)

Remains valid – not updated: [JVET-AK2038](https://jvet-experts.org/doc_end_user/current_document.php?id=15344) Draft white paper on VSEI [J. Boyce, S. McCarthy, S. Deshpande, G. J. Sullivan, Y. Sanchez, Y.-K. Wang] (2025-03-21)

Planned to be presented to AG 3 in the next meeting (with possible editorial improvements), and target to release the final version by October.

# Future meeting plans, expressions of thanks, a.o.b., and closing of the meeting

The draft of the WG 5 recommendations (see Annex C) was reviewed and approved in JVET at XXXX-XXXX on Friday 4 July.

Future meeting plans were established with the following general guidelines (assuming face-to-face meetings):

* Meeting under ITU-T SG21 auspices when it meets (ordinarily starting meetings on the Tuesday or Wednesday of the first week and closing it on the Wednesday of the second week of the SG21 meeting – a total of 8-9 meeting days), and
* Otherwise meeting under ISO/IEC JTC 1/‌SC 29 auspices when its MPEG WGs meet (ordinarily starting meetings on the Thursday or Friday prior to the main week of such meetings and closing it on the same day as other MPEG WGs – a total of 8–9 meeting days).

In cases where an exceptionally high workload is expected for a meeting, an earlier starting date may be defined, or AHG meetings might be scheduled prior to the meeting. In cases of online meetings, no sessions should be held on weekend days, such that meetings would typically start two days earlier.

Some specific future meeting plans (to be confirmed) were established as follows:

* During 3 – 12 October 2025, 40th meeting under ITU-T SG21 auspices in Geneva, CH, to be conducted as hybrid meeting (starting Friday 3 Oct. afternoon for opening and AHG reports only; an AHG meeting might start 1-2 days earlier to prepare CfE viewing),
* During 14 – 23 January 2026, 41st meeting under ISO/IEC JTC 1/‌SC 29 auspices, to be conducted as teleconference meeting,
* During 24 April – 1 May 2026, 42nd meeting under ISO/IEC JTC 1/‌SC 29 auspices in Santa Eulària, ES, to be conducted as hybrid meeting,
* During 7 – 15 July 2026, 43rd meeting under ITU-T SG21 auspices in Geneva, CH, to be conducted as hybrid meeting,
* During 14 – 23 October 2026, 44th meeting under ISO/IEC JTC 1/‌SC 29 auspices in Hangzhou, CN, to be conducted as hybrid meeting,
* During January 2027, 45th meeting under ISO/IEC JTC 1/‌SC 29 auspices, date and location t.b.d.
* During April 2027, 46th meeting under ITU-T SG21 auspices, date and location t.b.d.
* During July 2027, 47th meeting under ISO/IEC JTC 1/‌SC 29 auspices, date and location t.b.d.

The agreed document deadline for the 40th JVET meeting was planned to be Friday 26 Sept. 2025.

Huawei, NERC-DTV, TCL, vivo, and Xiaomi were thanked for offering test material that could be used in the development of video coding standards.

Marius Preda was thanked for the service of managing and assistance in maintaining the document site jvet-experts.org. Institut Mines-Télécom was thanked for hosting the site.

It was remarked by the chair that the meeting time of this teleconference meeting was not sufficient to review all contributions in sufficient detail (e.g., in categories 4.17, 4.18, and 5.2.4 some categories could not be reviewed and discussed in the detail they might have deserved). Also, priorities needed to be set, and 4 contributions (JVET-AL0333, JVET-AL0334, JVET-AL0335, and JVET-AL0341) which were submitted very late as new proposals could not be reviewed. These were deferred to the next meeting.

The 39th JVET meeting was closed at approximately XXXX hours KST on Friday 04 July 2025.

# Annex A to JVET report:List of documents

Dates and times in the table below are in Paris/Geneva time (1 hr. ahead of UTC before 30 March, 2 hrs. afterwards). It is noted that, if title or authorship of a document deviates from the title or author list in the body of the report, the list of documents in this annex contains the correct title and authors.

# Annex B1 to JVET report:List of meeting participants attending in person

The participants who were personally present at the meeting site of the thirty-ninth meeting of the JVET, according to a sign-in sheet circulated in the JVET meeting rooms (approximately XXX people in total), were as follows:

1. xx

# Annex B2 to JVET report:List of meeting participants attending remotely

The remote participants of the thirty-ninth meeting of the JVET, according to the participation records from the Zoom teleconferencing tool used for the meeting sessions (approximately XXX people in total, not including those who had attended the meeting in person at least part-time (see annex B1), and not including those who attended only the joint sessions with other groups), were as follows:

1. xx

# Annex C to JVET report:Recommendations of the 20th meeting ofISO/IEC JTC 1/SC 29/WG 5 MPEG Joint Video Experts Team with ITU-T SG21

**ISO/IEC JTC 1/SC 29/WG 5 N XXX**