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| **Joint Video Experts Team (JVET)**  **of ITU-T SG 16 WP 3 and ISO/IEC JTC 1/SC 29/WG 11**  14th Meeting: Geneva, CH, 19–27 March 2019 | Document: JVET-N\_Notes\_d0 |

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| *Title:* | **Meeting Report of the 14th Meeting of the Joint Video Experts Team (JVET), Geneva, CH, 19–27 March 2019** | | |
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| *Purpose:* | Report | | |
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| *Source:* | Chairs of JVET | | |

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# Summary

The Joint Video Experts Team (JVET) of ITU-T WP3/16 and ISO/IEC JTC 1/ SC 29/ WG 11 held its fourteenth meeting during 19–27 March 2019 at the ITU-T premises in Geneva, CH. The JVET meeting was held under the chairmanship of Dr Gary Sullivan (Microsoft/USA) and 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 2.13 of this document. 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 a new standard. The name Versatile Video Coding (VVC) was chosen in April 2018 as the informal nickname for the new standard.

The JVET meeting began at approximately 0900 hours on Tuesday 19 March 2019. Meeting sessions were held on all days (including weekend days) until the meeting was closed at approximately XXXX hours on Wednesday 27 March 2019. Approximately XXX people attended the JVET meeting, and approximately XXXqq input documents and 19 AHG reports were discussed. The meeting took place in a collocated fashion with a meeting of ITU-T SG16 – one of the two parent bodies of the JVET. The subject matter of the JVET meeting activities consisted of developing video coding technology with a compression capability that significantly exceeds that of the current HEVC standard, or otherwise gives better support regarding the requirements of future application domains of video coding. As a primary goal, the JVET meeting reviewed the work that was performed in the interim period since the thirteenth JVET meeting in producing a fourth draft of the VVC standard and the fourth version of the associated VVC test model (VTM). Further important goals were reviewing the results of 13 Core Experiments (CE), reviewing other technical input on novel aspects of video coding technology, and producing the next versions of the VVC draft text and VTM, and plan next steps for further investigation of candidate technology towards the formal standard development.

The JVET produced 18 output documents from the meeting (update):

* JVET-M1001 Versatile Video Coding specification text (Draft 4)
* JVET-M1002 Algorithm description for Versatile Video Coding and Test Model 4 (VTM 4)
* JVET-M1004 Algorithm descriptions of projection format conversion and video quality metrics in 360Lib (Version 9)
* JVET-M1006 Methodology and reporting template for coding tool testing and for neural network tool testing
* JVET-M1010, JVET-L1011, and JVET-L1012 JVET common test conditions and software reference configurations for SDR, HDR/WCG, and 360° video
* JVET-M1021 through JVET-M1033, Description of Core Experiments 1 through 13

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, XX Core Experiments (CE) were defined. The next four JVET meetings were planned for 3–12 July 2019 under WG 11 auspices in Gothenburg, SE, during 1–9 October 2019 under ITU-T SG16 auspices in Geneva, CH, during 8–17 January 2020 under WG 11 auspices in Brussels, BE, and during 15–24 April 2020 under WG 11 auspices in Alpbach, AT.

The document distribution site <http://phenix.it-sudparis.eu/jvet/> was used for distribution of all documents.

The reflector to be used for discussions by the JVET and all its AHGs is the JVET reflector:  
[jvet@lists.rwth-aachen.de](mailto: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 16 Visual Coding Experts Group (VCEG) and the ISO/IEC JTC 1/SC 29/WG 11 Moving Picture Experts Group (MPEG). The parent bodies of the JVET are ITU-T WP3/16 and ISO/IEC JTC 1/SC 29/WG 11.

The Joint Video Experts Team (JVET) of ITU-T WP3/16 and ISO/IEC JTC 1/SC 29/WG 11 held its fourteenth meeting during 19–27 March 2019 at the ITU-T premises in Geneva, CH. The JVET meeting was held under the chairmanship of Dr Gary Sullivan (Microsoft/USA) and Dr Jens-Rainer Ohm (RWTH Aachen/Germany).

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 a new standard. The name Versatile Video Coding (VVC) was chosen in April 2018 as the informal nickname for the new standard.

## Meeting logistics

Information regarding logistics arrangements for the meeting had been provided via the email reflector [jvet@lists.rwth-aachen.de](mailto:jvet@lists.rwth-aachen.de) and at <http://wftp3.itu.int/av-arch/jvet-site/2019_03_N_Geneva/>.

## Primary goals

As a primary goal, the JVET meeting reviewed the work that was performed in the interim period since the thirteenth JVET meeting in producing a fourth draft of the VVC standard and the fourth version of the associated VVC test model (VTM). Further important goals were reviewing the results of 13 Core Experiments (CE), reviewing other technical input on novel aspects of video coding technology, and producing the next versions of draft text and VTM, and plan next steps for further investigation of candidate technology towards the formal standard development.

## Documents and document handling considerations

### General

The documents of the JVET meeting are listed in Annex A of this report. The documents can be found at <http://phenix.it-sudparis.eu/jvet/>.

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 (other than as contribution registration and upload times) follow the local time at the meeting facility.

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 the VTM or BMS software but have no normative effect are marked by the string “Decision (SW):”.
* Decisions that fix a “bug” in the VTM description (an error, oversight, or messiness) or in the software are marked by the string “Decision (BF):”.

This meeting report is based primarily on notes taken by the JVET chairs. 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.

### Late and incomplete document considerations

The formal deadline for registering and uploading non-administrative contributions had been announced as Tuesday, 12 March 2019. Any documents uploaded after 1159 hours Paris/Geneva time on Wednesday 13 March were considered “officially late”, giving 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, CE summaries, 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-N0500 were registered after the “officially late” deadline (and therefore were also uploaded late). However, some documents in the “M0501+” range might include break-out activity reports that were generated during the meeting, and are therefore better considered as report documents rather than as late contributions. Also, many cross-check reports were uploaded late.

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 was 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 was agreed to be a helpful approach to be followed at the meeting.

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

* JVET-N0XXX (a proposal on …), uploaded 03-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. For example, some of them were proposing combinations or simplifications of other proposals.

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

* JVET-N0XXX (a document on …), uploaded 03-XX.
* ….

All cross-verification reports were both registered late and uploaded late (all with numbers higher than JVET-N0500) and therefore are not specifically identified here, in the interest of brevity. Initial upload times for each document are recorded in Annex A of this report.

The following (X) contribution registrations were later cancelled, withdrawn, never provided, were cross-checks of a withdrawn contribution, or were registered in error: JVET-N0XXX (withdrawn), … .

“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 typically be counted as a late contribution). At the current meeting, this situation applied to the initial uploads of documents JVET-N0213 and JVET-N0366.

Contributions that had significant problems with uploaded versions included the following:

* JVET-N0XXX (…)
* …

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 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 was some expression of annoyance and remarks on the difficulty of dealing with late contributions and late revisions.

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.

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.). These 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 were 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-M1000, the Versatile Video Coding specification text (Draft 4) JVET-M1001, the Algorithm description for Versatile Video Coding and Test Model 4 (VTM 4) JVET-M1002, the Algorithm descriptions of projection format conversion and video quality metrics in 360Lib Version 9 JVET-M1004, the Methodology and reporting template for neural network tool testing JVET-M1006, the JVET common test conditions and software reference configurations for SDR video JVET-M1010, and the Description of Core Experiments 1 through 13 (JVET-M1021 through JVET-M1033), had been completed and were approved. The software implementation of VTM (versions 4.0, 4.0.1 and 4.1), and the 360Lib software implementation (version 9.0) were also approved.

The group was initially asked to review the meeting report of the previous meeting for finalization. The meeting report was later approved without modification.

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 Annex B of this report.

The meeting was open to those qualified to participate either in ITU-T WP3/16 or ISO/IEC JTC 1/‌SC 29/‌WG 11 (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.

## Agenda

The agenda for the meeting was as follows:

* Opening remarks and review of meeting logistics and communication practices
* IPR policy reminder and declarations
* Contribution document allocation
* Review of results of the previous meeting
* Reports of *ad hoc* group (AHG) activities
* Reports of core experiments planned at the previous meeting
* Consideration of contributions and communications on project guidance
* Consideration of additional video coding technology contributions
* Consideration of information contributions
* Coordination activities
* Approval of output documents and associated editing periods
* Future planning: Determination of next steps, discussion of working methods, communication practices, establishment of coordinated experiments, establishment of AHGs, meeting planning, other planning issues
* Other business as appropriate for consideration

## 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)
* <http://www.itscj.ipsj.or.jp/sc29/29w7proc.htm> (JTC 1/‌SC 29 Procedures)

It is noted that the ITU TSB director’s AHG on IPR had issued a clarification of the IPR reporting process for ITU-T standards, as follows, per SG 16 TD 327 (GEN/16):

“TSB has reported to the TSB Director’s IPR Ad Hoc Group that they are receiving Patent Statement and Licensing Declaration forms regarding technology submitted in Contributions that may not yet be incorporated in a draft new or revised Recommendation. The IPR Ad Hoc Group observes that, while disclosure of patent information is strongly encouraged as early as possible, the premature submission of Patent Statement and Licensing Declaration forms is not an appropriate tool for such purpose.

In cases where a contributor wishes to disclose patents related to technology in Contributions, this can be done in the Contributions themselves, or informed verbally or otherwise in written form to the technical group (e.g. a Rapporteur’s group), disclosure which should then be duly noted in the meeting report for future reference and record keeping.

It should be noted that the TSB may not be able to meaningfully classify Patent Statement and Licensing Declaration forms for technology in Contributions, since sometimes there are no means to identify the exact work item to which the disclosure applies, or there is no way to ascertain whether the proposal in a Contribution would be adopted into a draft Recommendation.

Therefore, patent holders should submit the Patent Statement and Licensing Declaration form at the time the patent holder believes that the patent is essential to the implementation of a draft or approved Recommendation.”

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 software implementation package uses 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](http://phenix.it-sudparis.eu/mpeg/doc_end_user/current_document.php?id=27881&id_meeting=16) of the 89th meeting of ISO/IEC JTC 1/‌SC 29/‌WG 11. Both ITU and ISO/IEC will be identified in the <OWNER> and <ORGANIZATION> tags in the header. This software is used in the process of designing the VTM software, and for evaluating proposals for technology to be potentially included in the design. 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 and HDRtools as well.

## Communication practices

The documents for the meeting can be found at <http://phenix.it-sudparis.eu/jvet/>.

It was reminded to send a notice to the chairs in cases of changes to document titles, authors etc.

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](mailto: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 was 928.

For distribution of test sequences, a password-protected ftp site had been set up at RWTH Aachen University, with a mirror site at FhG-HHI. Accredited members of JVET may contact the responsible JVET coordinators to obtain the password information (but the site is not open for use by others).

## Terminology

Some terminology used in this report is explained below:

* **ACT**: Adaptive colour transform.
* **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 set.
* **AMVR**: (Locally) adaptive motion vector resolution.
* **APS**: Adaptation parameter set.
* **ARC**: Adaptive resolution conversion (synonymous with DRC, and a form of RPR).
* **ARSS**: Adaptive reference sample smoothing.
* **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.
* **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**).
* **BL**: Base layer.
* **BMS**: Bench-mark set, a 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.
* **B(P)WA**: Bi-prediction weighted average
* **BR**: Bit rate.
* **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.
* **CCLM**: Cross-component linear model.
* **CCP**: Cross-component prediction.
* **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.
* **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.
* **CTC**: Common test conditions.
* **CVS**: Coded video sequence.
* **DCT**: Discrete cosine transform (sometimes used loosely to refer to other transforms with conceptually similar characteristics).
* **DCTIF**: DCT-derived interpolation filter.
* **DF**: Deblocking filter.
* **DMVR**: Decoder-side motion vector refinement.
* **DRC**: Dynamic resolution conversion (synonymous with ARC, and a form of RPR).
* **DT**: Decoding time.
* **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).
* **ECV**: Extended Colour Volume (up to WCG).
* **EL**: Enhancement layer.
* **ET**: Encoding time.
* **FRUC**: Frame rate up conversion (pattern matched motion vector derivation).
* **GBI**: …
* **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 constitutes our draft standard design – now also used especially in reference to the (non-normative) encoder algorithms (see WD and TM).
* **HMVP**: History based motion vector prediction.
* **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).
* **IPCM**: Intra pulse-code modulation (similar in spirit to IPCM in AVC and HEVC).
* **ISP**: Intra subblock partitioning
* **JEM**: Joint exploration model – the software codebase for future 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.
* **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.
* **LIC**: Local illumination compensation.
* **LM**: Linear model.
* **LP** or **LDP**: Low-delay P – the variant of the LD conditions that uses P frames.
* **LUT**: Look-up table.
* **LTRP**: Long-term reference pictures.
* **MC**: Motion compensation.
* **MCP**: Motion compensated prediction.
* **MDNSST**: Mode dependent non-separable secondary transform.
* **MMLM**: Multi-model (cross component) linear mode.
* **MPEG**: Moving picture experts group (WG 11, the parent body working group in ISO/IEC JTC 1/‌SC 29, one of the two parent bodies of the JVET).
* **MPM**: Most probable mode (in intra prediction).
* **MV**: Motion vector.
* **MVD**: Motion vector difference.
* **NAL**: Network abstraction layer (as in AVC and HEVC).
* **NSQT**: Non-square quadtree.
* **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.
* **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).
* **PDPC**: Position dependent (intra) prediction combination.
* **PMMVD**: Pattern-matched motion vector derivation.
* **POC**: Picture order count.
* **PoR**: Plan of record.
* **PPS**: Picture parameter set (as in AVC and HEVC).
* **QM**: Quantization matrix (as in AVC and HEVC).
* **QP**: Quantization parameter (as in AVC and HEVC, sometimes confused with quantization step size).
* **QT**: Quadtree.
* **BT**: Binary tree.
* **TT**: Ternary tree.
* **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.
* **RASL**: Random-access skipped leading.
* **R-D**: Rate-distortion.
* **RDO**: Rate-distortion optimization.
* **RDOQ**: Rate-distortion optimized quantization.
* **ROT**: Rotation operation for low-frequency transform coefficients.
* **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.
* **SAO**: Sample-adaptive offset.
* **SBT**: Subblock transform.
* **SbTMVP**: Subblock based temporal motion vector prediction.
* **SD**: Slice data; alternatively, standard-definition.
* **SDT**: Signal-dependent transform.
* **SEI**: Supplemental enhancement information (as in AVC and HEVC).
* **SH**: Slice header.
* **SHM**: Scalable HM.
* **SHVC**: Scalable high efficiency video coding.
* **SIMD**: Single instruction, multiple data.
* **SMVD**: Symmetric MVD.
* **SPS**: Sequence parameter set (as in AVC and HEVC).
* **STMVP**: Spatial-temporal motion vector prediction.
* **TBA/TBD/TBP**: To be announced/determined/presented.
* **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.
* **TPM**: Triangular partitioning mode
* **UCBDS**: Unrestricted center-biased diamond search.
* **UWP**: Unequal weight prediction.
* **VCEG**: Visual coding experts group (ITU-T Q.6/16, the relevant rapporteur group in ITU-T WP3/16, which is one of the two parent bodies of the JVET).
* **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.
* **VTM**: VVC Test Model.
* **VVC**: Versatile Video Coding, the standardization project developed by JVET.
* **WAIP**: …
* **WCG**: Wide colour gamut.
* **WG**: Working group, a group of technical experts (usually used to refer to WG 11, a.k.a. MPEG).
* **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.

## Opening remarks

Remarks during the opening session of the meeting 0900 Tuesday 19 March (chaired by GJS and JRO) were as follows.

* The meeting logistics, agenda, working practices, policies, and document allocation were reviewed.
* The results of the previous meeting were reviewed.
* On placeholders – there were a number of cases where there was some description of a concept but no test results (see section 2.4.2).
* The primary goals of the meeting were to review the results of CEs, identify promising technology directions, and adopt proposed technology into the VVC draft text and VTM.
* Due to the high number of input contributions, parallelization and breakout work were planned to be used at the meeting.
* Planning of viewing & equipment setup
* Principles of standards development were discussed.
* Standardization timelines …

## Scheduling of discussions

Scheduling: Generally meeting time was scheduled during 0900–2100+ hours, with coffee and lunch breaks as convenient. Ongoing scheduling refinements were announced on the group email reflector as needed. Some particular scheduling notes are shown below, although not necessarily 100% accurate or complete:

* Tue. 19 March, 1st day
  + 0900–XXXX Opening plenary (chaired by GJS & JRO)
* Wed. 20 March, 2nd day

## 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 may not be completely accurate):

* AHG reports (19) (section 3) (Plenary)
* Project development (X) (section 4) (Plenary)
  + Text an software development (5)
  + Test conditions (5)
  + Peformance assessment (1)
  + Coding studies on specific use cases (14)
  + Test Material (2)
* Core Experiments (xx) (section 5) with subtopics
  + CE1: Post prediction and post reconstruction filtering (9) (section 5.1) (Track A)
  + CE2: Subblock motion compensation (20) (section 5.2) (Track B)
  + CE3: Intra prediction and mode coding (19) (section 5.3) (Track A)
  + CE4: Inter prediction and motion vector coding (18) (section 5.4) (Track B)
  + CE5: Adaptive loop filtering (4) (section 5.5) (Track A)
  + CE6: Transforms and transform signalling (4) (section 5.6) (Track A)
  + CE7: Quantization and coefficient coding (4) (section 5.7) (Track A)
  + CE8: Screen content coding tools (9) (section 5.8) (Track A)
  + CE9: Decoder motion vector derivation (7) (section 5.9) (Track B)
  + CE10: Combined intra/inter prediction (2) (section 5.10) (Track B)
  + CE11: Deblocking (4) (section 5.11) (Track A)
  + CE12: Tile set boundary motion comp handling (2) (section 5.12) (Track B)
  + CE13: Neural network based loop filtering (5) (section 5.13) (Track A)
* Non-CE technology proposals (xx) (section 6) with subtopics
  + CE1 related – Post prediction and post reconstruction filtering (10) (section 6.1) (Track A)
  + CE2 related – Subblock motion compensation (16) (section 6.2) (Track B)
  + CE3 related – Intra prediction and mode coding (53) (section 6.3) (Track A)
  + CE4 related – Inter prediction and motion vector coding (40) (section 6.4) (Track B)
  + CE5 related – Adaptive loop filtering (3) (section 6.5) (Track A)
  + CE6 related – Transforms and transform signalling (26) (section 6.6) (Track A)
  + CE7 related – Quantization and coefficient coding (11) (section 6.7) (Track A)
  + CE8 related – Screen content coding tools (40) (section 6.8) (Track A)
  + CE9 related – Decoder motion vector derivation (33) (section 6.9) (Track B)
  + CE10 related – Combined intra/inter prediction (3) (section 6.10) (Track B)
  + CE11 related – Deblocking (3) (section 6.11) (Track A)
  + CE12 related – Tile set boundary motion comp handling (3) (section 6.12) (Track B)
  + CE13 related – Neural network based loop filtering (1) (section 6.13) (Track A)
  + Quantization (3) (section 6.14) (Track A)
  + Entropy coding (8) (section 6.15) (Track A)
  + Reshaper (9) (section 6.16) (Track A)
  + Other coding tools (3) (section 6.17) (Track A)
  + High-level syntax (78) (section 6.18) (Track B)
* Complexity analysis and reduction (2) (section 7) (Track A)
* Encoder optimization (2) (section 8) (Track A)
* Metrics and evaluation criteria (0) (section 9) (Track none)
* Withdrawn (6) (Track none)
* Joint meetings, plenary discussions, BoG reports, Summary of actions (section 10)
* Project planning (section 12)
* Establishment of AHGs (section 13)
* Output documents (section 14)
* Future meeting plans and concluding remarks (section 15)

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

Track A (58+174) was generally chaired by JRO, and Track B (49+173) by GJS.

# AHG reports (19)

These reports were discussed Tuesday 19 March XXXX–XXXX (chaired by GJS and JRO).

[JVET-N0001](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6334) JVET AHG report: Project management (AHG1) [J.-R. Ohm, G. J. Sullivan]

[JVET-N0002](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6329) JVET AHG report: Draft text and test model algorithm description editing (AHG2) [B. Bross, J. Chen, J. Boyce, S. Kim, S. Liu, Y. Ye]

[JVET-N0003](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6366) JVET AHG report: Test model software development (AHG3) [F. Bossen, X. Li, A. Norkin, K. Sührung]

[JVET-N0004](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6231) JVET AHG report: Test material and visual assessment (AHG4) [T. Suzuki, V. Baroncini, R. Chernyak, P. Hanhart, A. Norkin, J. Ye]

[JVET-N0005](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6367) JVET AHG report: Memory bandwidth consumption of coding tools (AHG5) [R. Hashimoto, T. Ikai, X. Li, D. Luo, H. Yang, M. Zhou]

[JVET-N0006](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6337) JVET AHG Report: 360 video conversion software development (AHG6) [Y. He, K. Choi]

[JVET-N0007](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6368) JVET AHG report: Coding of HDR/WCG material (AHG7) [A. Segall, E. François, W. Husak, D. Rusanovskyy]

[JVET-N0008](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6286) JVET AHG report: 360° video coding tools and test conditions (AHG8) [J. Boyce, K. Choi, P. Hanhart, J.-L. Lin]

[JVET-N0009](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6330) JVET AHG report: Neural Networks in Video Coding (AHG9) [S. Liu, K. Kawamura, Y. Li, L. Wang, P. Wu, H. Yang]

[JVET-N0010](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6369) JVET AHG report: Encoding algorithm optimization (AHG10) [A. Duenas, A. Tourapis, C. Helmrich, S. Ikonin, A. Norkin, R. Sjöberg, T. Toma]

[JVET-N0011](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6331) JVET AHG report: Screen Content Coding (AHG11) [S. Liu, J. Boyce, A. Filippov, Y.-C. Sun, J. Xu, M. Zhou]

[JVET-N0012](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6256) JVET AHG report: High-level parallelism and coded picture regions (AHG12) [S. Deshpande, M. M. Hannuksela, R. Sjöberg, R. Skupin, W. Wan, Y.-K. Wang, S. Wenger]

[JVET-N0013](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6370) JVET AHG report: Tool reporting procedure (AHG13) [W.-J. Chien, J. Boyce, Y.-W. Chen, R. Chernyak, K. Choi, R. Hashimoto, Y.-W. Huang, H. Jang, S. Liu, D. Luo]

[JVET-N0014](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6371) JVET AHG report: Progressive intra refresh (AHG14) [J.-M. Thiesse, A. Duenas, K. Kazui, R. Sjöberg, A. Tourapis]

[JVET-N0015](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6287) JVET AHG report: Bitstream decoding properties signalling (AHG15) [J. Boyce, J. Chen, S. Deshpande, M. Karczewicz, A. Tourapis, Y.-K. Wang, S. Wenger]

[JVET-N0016](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6226) JVET AHG report: Implementation studies (AHG16) [M. Zhou, J. An, E. Chai, K. Choi, S. Sethuraman, T. Hsieh, X. Xiu]

[JVET-N0017](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6342) JVET AHG report: High-level syntax (AHG17) [R. Sjöberg, S. Deshpande, M. M. Hannuksela, R. Skupin, Y.-K. Wang, S. Wenger, H. Yu]

[JVET-N0018](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6251) JVET AHG report: Quantization control (AHG18) [R. Chernyak, E. François, C. Helmrich, A. Segall]

[JVET-N0019](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6358) JVET AHG report: Layered coding and resolution adaptivity (AHG19) [S. Wenger, A. Segall, M.M. Hannuksela, Hendry, S. McCarthy, Y.-C. Sun]

# Project development (X)

Contributions in this category were discussed XXday XX March XXXX–XXXX (chaired by XXXqq).

## Text and software development (5)

[JVET-N0468](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6190) AhG2: Editorial Suggestion on the text specification for Inter and IBC mode [H. Jang, J. Nam, N. Park, J. Lim, S. Kim (LGE)]

[JVET-N0470](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6192) AhG2: Mismatch between text specification and reference software on SMVD [H. Jang, J. Nam, N. Park, J. Lim, S. Kim (LGE)]

[JVET-N0474](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6196) Comments on algorithm description document for VTM [S.-H. Park, J.-W. Kang (Ewha W. Univ.)]

[JVET-N0503](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6225) Proposed update to Guidelines for VVC reference software development [F. Bossen, X. Li, K. Sühring] [late]

[JVET-N0512](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6238) AhG2: Editorial Suggestion on the text specification for INTRA with interaction part between INTRA and IBC [H. Jang, J. Heo, J. Nam, S. Yoo, J. Choi, J. Lim, S. Kim (LGE)] [late]

## Test conditions (5)

[JVET-N0320](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6041) On improving reports of software encoder run times [F. Bossen (Sharp)]

[JVET-N0331](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6052) On interpolation for BD rate computation [F. Bossen (Sharp)]

[JVET-N0341](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6062) On reporting combined YUV BD rates [F. Bossen (Sharp)]

[JVET-N0446](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6168) New Adaptive Streaming Test Conditions for the VVC development [M. Afonso, A. Norkin, J. Sole, K. Swanson, A. Aaron (Netflix), J. Kim, K. Kolarov, D. Singer, A. Tourapis (Apple), Y. Ye, W. Jiang (Alibaba)]

[JVET-N0506](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6229) Disabling raster search in integer-pel ME for common test condition [S.-H. Park, J.-W. Kang (Ewha W. Univ.)] [late]

## Performance assessment (1)

[JVET-N0605](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6346) Comparative study of video coding solutions VVC, AV1, EVC versus HEVC [Y. Chen, E. François, F. Galpin, R. Jullian, M. Kerdranvat (Technicolor)] [late]

## Coding studies on specific use cases (14)

### Adaptive resolution conversion (6)

Contributions in this category were discussed XXday XX March XXXX–XXXX (chaired by XXXqq).

[JVET-N0048](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5768) AHG19: On adaptive resolution changing [M. M. Hannuksela, A. Aminlou (Nokia)]

[JVET-N0052](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5772) [AHG19] On Signaling of Adaptive Resolution Change [S. Wenger, B. Choi, S. Liu (Tencent)]

[JVET-N0118](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5838) AHG19: Adaptive resolution change (ARC) support in VVC [Hendry, S. Hong, Y.-K. Wang, J. Chen (Huawei), Y.-C Sun, T.-S Chang, J. Lou (Alibaba)]

[JVET-N0279](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6000) AHG19: Adaptive resolution change [Peisong Chen, Tim Hellman, Brian Heng, Wade Wan, Minhua Zhou (Broadcom)]

[JVET-N0422](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6144) AHG19: Support of adaptive resolution change (ARC) in VVC [H. Wang, N. Hu, M. Coban, W.-J. Chien, V. Seregin, M. Karczewicz (Qualcomm)]

[JVET-N0532](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6260) AHG19: Resampling filters for adaptive resolution change (ARC) in VVC [Pankaj Topiwala, Madhu Krishnan, Wei Dai (FastVDO)] [late]

### 360° video coding (4)

Contributions in this category were discussed XXday XX March XXXX–XXXX (chaired by XXXqq).

[JVET-N0070](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5790) AHG16/AHG8: Proposed Cleanup for Reference Wraparound [B. Heng, M. Zhou, W. Wan (Broadcom)]

[JVET-N0219](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5939) Coding of 360° video in HEC using different numbers of tiles per face [J. Sauer, M. Bläser (RWTH Aachen)]

[JVET-N0232](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5952) [AHG8] Coding performance of 360° Videos in PHEC format with different face sizes [A. DSouza, C. Pujara, R. Gadde, W. Choi, K. Choi, K.P. Choi (Samsung)] [late]

[JVET-N0233](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5953) [AHG8] Alternate face arrangement for PHEC [A. DSouza, C. Pujara, R. Gadde, W. Choi, K. Choi, K.P. Choi (Samsung)] [late]

### Chroma sampling and chroma formats (4)

[JVET-N0225](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5945) Various chroma format support in VVC [L. Li, J. Heo, J. Nam, M. Koo, J. Lim, S. Kim (LGE)] [miss] [late]

[JVET-N0367](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6088) Support of chroma 4:4:4 format in VVC [X. Zhao, X. Li, X. Xu, S. Liu (Tencent)]

[JVET-N0392](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6114) 4:4:4 and 4:2:2 chroma formats support for VVC [A. Filippov, V. Rufitskiy, T. Solovyev, R. Chernyak, J. Chen (Huawei)] [late]

[JVET-N0414](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6136) Modifications to support the YUV 4:4:4 chroma format [H. Wang, Y.-H. Chao, W.-J. Chien, V. Seregin, M. Karczewicz (Qualcomm)]

## Test material (2)

[JVET-N0386](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6108) AOV YUV4:4:4 sequence for VVC standardization and suggestions for class F [X. Xu, J. Ye, X. Li, S. Liu, L. Wu, C. Xie, K. Liu, B. Wang, P. Liu, K. Dong, Y. Kuang, W. Feng (Tencent)]

[JVET-N0502](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6224) Five SCC TGM sequences of both YUV4:4:4 and YUV4:2:0 formats [T. Lin, K. Zhou, S. Wang (Tongji), L. Zhao (Shaoxing)] [late]

# Core Experiments

## CE1: Post-prediction and post-reconstruction filtering (9)

Contributions in this category were discussed XXday XX March XXXX–XXXX (chaired by XXXqq).

[JVET-N0021](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6298) CE1: Summary Report on Post-prediction and post-reconstruction filtering [J. Ström, S. Ikonin, V. Seregin]

[JVET-N0059](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5779) CE1: Uniform Luma Inter Prediction Filter [J. Rasch, A. Henkel, J. Pfaff, M. Albrecht, H. Schwarz, D. Marpe, T. Wiegand (HHI)]

[JVET-N0074](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5794) CE1-5.5: Simplification of local illumination compensation [C.-M. Tsai, C.-C. Chen, C.-W. Hsu, Y.-W. Huang, S.-M. Lei (MediaTek)]

[JVET-N0521](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6247) Crosscheck of JVET-N0074 (CE1-5.5) [P. Bordes (Technicolor)] [miss] [late]

[JVET-N0205](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5925) CE1: Pipeline restriction and DBF modification on LIC (test 1.5.6, test 1.5.7) [K. Abe, T. Toma, J. Li, C.-W. Kuo, V. Drugeon (Panasonic)]

[JVET-N0283](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6004) CE1-5.4 mutual exclusion of LIC and BPWA [P. Bordes, F. Urban, T. Poirier (Technicolor)]

[JVET-N0343](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6064) CE1: Unidirectional illumination compensation (CE1-5.1) [V. Seregin, W.-J. Chien, T. Hsieh, N. Hu, M. Karczewicz (Qualcomm)]

[JVET-N0370](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6092) CE1: Intra reference sample deblocking (CE1.6) [Z. Zhang, K. Andersson, R. Sjöberg, J. Ström (Ericsson)]

[JVET-N0406](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6128) CE1: LIC applied after bi-prediction (CE1-5.3) [S. Bandyopadhyay, Y. He (InterDigital)]

[JVET-N0478](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6200) CE1: Hadamard transform domain filter (CE1-2) [S. Ikonin, V. Stepin, A. Karabutov, J. Chen (Huawei)]

[JVET-N0617](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6359) Crosscheck of JVET-N0478 (CE1: Hadamard transform domain filter): additional test results for HTDF at the “loop filter” position (CE1-2.3) [?? (??)] [miss] [late]

[JVET-N0489](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6211) CE1: Bilateral filter tests [J. Ström, P. Wennersten, J. Enhorn (Ericsson), K. Reuze, D. Rusanovskyy, M. Karczewicz (Qualcomm)]

## CE2: Subblock motion compensation (20)

Contributions in this category were discussed XXday XX March XXXX–XXXX (chaired by XXXqq).

JVET-N0022 Summary report …

[JVET-N0068](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5788) CE2: On restriction of memory bandwidth consumption of affine mode (CE2-4.8) [M. Zhou (Broadcom)]

[JVET-N0075](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5795) CE2-2.1: Simplification of constructed affine merging candidate derivation [Z.-Y. Lin, T.-D. Chuang, C.-Y. Chen, Y.-W. Huang, S.-M. Lei (MediaTek)]

[JVET-N0076](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5796) CE2-5.3: Simplifications for inherited affine merging candidates [Y.-L. Hsiao, T.-D. Chuang, C.-W. Hsu, C.-Y. Chen, Y.-W. Huang, S.-M. Lei (MediaTek)]

[JVET-N0078](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5798) CE2-5.6: Simplifications for inherited affine merging candidates at CTU row boundaries [Y.-L. Hsiao, T.-D. Chuang, C.-W. Hsu, C.-Y. Chen, Y.-W. Huang, S.-M. Lei (MediaTek), K. Zhang, L. Zhang, H. Liu, J. Xu (Bytedance)]

[JVET-N0195](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5915) CE2: Memory bandwidth reduction for the affine mode (Test 2.4.3) [J. Li, C.-W. Kuo, C. S.Lim (Panasonic)]

[JVET-N0196](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5916) CE2: Using the shorter-tap filter for 4x4 sized partitions (Test 2.4.6) [J. Li, C.-W. Kuo, C. S.Lim (Panasonic)]

[JVET-N0210](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5930) CE2-4.9: Integer motion compensation for regular inter mode [X.W. Meng (PKU), X. Zheng (DJI), S.S. Wang, S.W. Ma (PKU)]

[JVET-N0253](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5974) CE2-4.7: Motion compensation with padded samples for small coding units [H. Liu, L. Zhang, J. Chon, H. Chuang, K. Zhang, J. Xu, Y. Wang (Bytedance)]

[JVET-N0256](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5977) CE2: Worst-case Memory Bandwidth Reduction for affine (Test 2.4.5) [H. Huang, L. Pham Van, W.-J. Chien, M. Karczewicz (Qualcomm)]

[JVET-N0257](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5978) CE2: Alignment of affine control-point motion vector and subblock motion vector (Test 2.5.2) [H. Huang, W.-J. Chien, V. Seregin, H. Wang, M. Karczewicz (Qualcomm)]

[JVET-N0616](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6357) Crosscheck of JVET-N0257 (CE2: Alignment of affine control-point motion vector and subblock motion vector (Test 2.5.2)) [H. Chen (Huawei)] [late]

[JVET-N0261](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5982) CE2-1.1: Interweaved Prediction for Affine Motion Compensation [K. Zhang (Bytedance)]

[JVET-N0263](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5984) CE2-5.5: History-parameter-based affine model inheritance [K. Zhang (Bytedance)]

[JVET-N0272](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5993) CE2-5.4: Parameter-based affine model inheritance [K. Zhang (Bytedance)]

[JVET-N0319](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6040) CE2: Symmetric MVD for affine bi-prediction coding (CE2-1.2) [H. Yang, J. Luo, Y. He (InterDigital)]

[JVET-N0323](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6044) CE2: Reducing worst-case memory bandwidth of affine mode (CE2-4.2.a, CE2-4.2.b, CE2-4.2.c and CE2-4.2.d) [Y.-W. Chen, X. Wang (Kwai Inc.), H. Chen, T. Solovyev, H. Yang, J. Chen (Huawei)]

[JVET-N0377](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6099) CE2-5.1: Affine HMVP with modified affine inheritance [G. Li, X. Xu, X. Li, S. Liu (Tencent), J. Zhao, S. Kim (LGE)]

[JVET-N0378](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6100) CE2-2.2: Affine merge with prediction offset [G. Li, X. Xu, X. Li, S. Liu (Tencent)]

[JVET-N0379](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6101) CE2-4.10: Constraint on constructed affine MV range [G. Li, X. Xu, X. Li, S. Liu (Tencent)]

[JVET-N0529](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6257) Cross-check of JVET- N0379 (CE2-4.10: Constraint on constructed affine MV range) [J. Zhao (LGE)] [late]

[JVET-N0398](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6120) CE2-4.4: Affine block memory bandwidth reduction by MV clip [X. Li, G. Li, X. Xu, S. Liu (Tencent)]

## CE3: Intra prediction and mode coding (19)

Contributions in this category were discussed XXday XX March XXXX–XXXX (chaired by XXXqq).

[JVET-N0023](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6232) CE3: Summary Report on Intra Prediction and Mode Coding [G. Van der Auwera, L. Li, A. Filippov]

[JVET-N0081](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5801) CE3-2.2: Shared reference samples for multiple chroma intra CBs [Z.-Y. Lin, T.-D. Chuang, C.-Y. Chen, Y.-W. Huang, S.-M. Lei (MediaTek)]

[JVET-N0102](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5822) CE3-2.3: Chroma block coding and size restriction [C. Rosewarne, J. Gan (Canon)]

[JVET-N0104](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5824) CE3-3.5 Explicitly signal non angular modes in intra mode coding [J. Yao, J. Zhu, W. Cai, K. Kazui (Fujitsu)] [late]

[JVET-N0130](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5850) CE3: Reduced reference samples range for CCLM\_L and CCLM\_T (Tests 1.3.1, 1.3.2 and 1.3.3) [S. Wan (NPU), Q.-H. Ran, X.-W. Li, J.-Y. Huo, Y.-Z. Ma, F.-Z. Yang (Xidian Univ.), Y.-F. Yu, Y. Liu (OPPO)]

[JVET-N0131](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5851) CE3: Offset-based reference sample reduction for CCLM (Tests 1.2.1 and 1.2.2) [J.-Y. Huo, X.-W. Li, J.-L. Wang, X.-Y. Chai, Y.-Z. Ma, F.-Z. Yang, B.-Z. Shen (Xidian Univ.), S. Wan (NPU), Y.-F. Yu, Y. Liu (OPPO)]

[JVET-N0134](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5854) CE3: Simplification of MPM derivation (CE3-3.2) [J. Lee, H. Lee, S.-C. Lim, J. Kang, H. Y. Kim (ETRI)]

[JVET-N0137](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5857) CE3-2.1: Intra chroma partitioning and prediction [[T. Zhou](mailto:zhou.tianyang@sharp.co.jp), [T. Ikai (Sharp)](mailto:ikai.tomohiro@sharp.co.jp)]

[JVET-N0140](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5860) CE3-2.1.3: Combination of CE3-2.1.1 and CE3-2.2 [T. Zhou, T. Ikai (Sharp), Z.-Y. Lin, T.-D. Chuang, C.-Y. Chen, Y.-W. Huang, S.-M. Lei (MediaTek)]

[JVET-N0184](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5904) CE3-3.1.1: Unified MPM list generation with changed order to include tools such as MRL, intra sub-partition coding, etc. [B. Wang, A. M. Kotra, S. Esenlik, H. Gao, J. Chen (Huawei), L. Li, J. Heo, J. Choi, S. Yoo, J. Lim, S. Kim (LGE)]

[JVET-N0217](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5937) CE3: Affine linear weighted intra prediction (CE3-4.1, CE3-4.2) [J. Pfaff, B. Stallenberger, M. Schäfer, P. Merkle, P. Helle, T. Hinz, H. Schwarz, D. Marpe, T. Wiegand (HHI)]

[JVET-N0582](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6316) Crosscheck of JVET-N0217 (CE3: Affine linear weighted intra prediction (CE3-4.1, CE3-4.2)) [F. Racapé (Technicolor)] [late]

[JVET-N0228](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5948) CE3: Reduced number of reference samples for CCLM parameter calculation (CE3-1.4.1 and CE3-1.4.2) [J. Choi, J. Heo, S. Yoo, L. Li, J. Choi, J. Lim, S. Kim (LGE)]

[JVET-N0241](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5961) CE3: Results of Test CE3-1.8 on multiple model LM using piecewise linear model [C. Gisquet, G. Laroche, P. Onno, J. Taquet (Canon)]

[JVET-N0264](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5985) CE3-1.7: Multiple-model LM with small block size restriction [P.-H. Lin (Foxconn), A. K. Ramasubramonian, G. Van der Auwera, T. Hsieh, V. Seregin, M. Karczewicz (Qualcomm)]

[JVET-N0271](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5992) CE3-1.5: CCLM derived from four neighbouring samples [M. Wang, K. Zhang (Bytedance)]

[JVET-N0321](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6042) CE3: Simplification of LM mode (CE3-1.6) [Y.-W. Chen, H.-J. Jhu, X. Wang (Kwai Inc.)]

[JVET-N0577](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6311) Crosscheck of JVET-N0321: CE3: Simplification of LM mode (Tests CE3-1.6.3 and CE3-1.6.5) [L. Pham Van, G. Van der Auwera, A. K. Ramasubramonian, H. Huang, M. Karczewicz (Qualcomm)] [late]

[JVET-N0387](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6109) CE3: report of CE3-1.1 on reduction of the number of reference samples in CCLM mode [E. François (Technicolor)]

[JVET-N0393](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6115) CE3-3.3: MPM list harmonization [L. Zhao, X. Zhao, X. Li, S. Liu (Tencent)]

[JVET-N0436](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6158) CE3-3.4.1, CE3-3.4.2, CE3-3.4.3: Results for unified MPM list construction process [F. Bossen, K. Misra (Sharp Labs of America)]

[JVET-N0451](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6173) CE3-3.1.2: Harmonization on MPM list [J. Heo, L. Li, J. Choi, J. Choi, S. Yoo, J. Lim, S. Kim (LGE)]

## CE4: Inter prediction and motion vector coding (18)

Contributions in this category were discussed XXday XX March XXXX–XXXX (chaired by XXXqq).

[JVET-N0024](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6365) CE4: Summary report on inter prediction and motion vector coding [H. Yang, G. Li, K. Zhang]

[JVET-N0083](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5803) CE4-4.1: Simplification of triangle merging candidate list derivation [T.-D. Chuang, C.-Y. Chen, Y.-W. Huang, S.-M. Lei (MediaTek)]

[JVET-N0125](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5845) CE4-3.1: MMVD binarization [S. Jeong, M. W. Park, K. Choi (Samsung)]

[JVET-N0128](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5848) CE4-4.2: Triangle Prediction Mode Harmonization [A. Tamse, M. W. Park, K. Choi (Samsung)]

[JVET-N0584](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6318) Cross-check of JVET-N0128: CE4-4.2: Triangle Prediction Mode Harmonization [H. Wang (Qualcomm)] [miss] [late]

[JVET-N0141](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5861) CE4-1.1: Syntax Change of MMVD [E. Sasaki, T. Chujoh, T. Ikai (Sharp)]

[JVET-N0142](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5862) CE4-3.4: Diagonal direction candidate for MMVD [T. Hashimoto, E. Sasaki, T. Ikai (Sharp)]

[JVET-N0197](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5917) CE4: Triangle merge candidate list simplification (Test 4.4.7) [J. Li, C.-W. Kuo, C. S.Lim (Panasonic)]

[JVET-N0211](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5931) CE4-4.8: Triangle merge candidate list derivation simplification [X.W. Meng (PKU), X. Zheng (DJI), S.S. Wang, S.W. Ma (PKU)]

[JVET-N0212](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5932) CE4-1.5: Remove TMVP merge candidate for the specified blocksizes [S.H. Wang (PKU), X. Zheng (DJI), S.S. Wang, S.W. Ma (PKU)]

[JVET-N0226](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5946) CE4-4.5: Pruning reduction in Triangle Merge mode [A. Robert, T. Poirier, F. Le Léannec, F. Galpin (Technicolor)]

[JVET-N0237](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5957) CE4-1.3: Modification of merge data syntax [G. Ko, D. Kim, J. Jung, J. Son, J. Kwak (WILUS)]

[JVET-N0252](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5973) CE4-1.4: Syntax changes of merge data [Y. Ahn, D. Sim (Digital Insights)]

[JVET-N0269](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5990) CE4-4.4: Merge list construction for triangular prediction mode [L. Zhang (Bytedance)]

[JVET-N0285](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6006) CE4-2.2: Pairwise extension with STMVP [F. Le Léannec, A. Robert, T. Poirier (Technicolor)]

[JVET-N0322](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6043) CE4: Triangle prediction merge list construction (CE4-4.3) [X. Wang, Y.-W. Chen (Kwai Inc.)]

[JVET-N0585](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6319) Cross-check of JVET-N0322: CE4: Triangle prediction merge list construction (CE4-4.3) [H. Wang (Qualcomm)] [miss] [late]

[JVET-N0324](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6045) CE4: Regular merge flag coding (CE4-1.2.a and CE4-1.2.b) [Y.-W. Chen, X. Wang (Kwai Inc.)]

[JVET-N0418](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6140) CE4: Using regular merge candidate list for triangular PU mode (CE4-4.9) [H. Wang, V. Seregin, W.-J. Chien, M. Karczewicz (Qualcomm)]

[JVET-N0441](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6163) CE4-3.3: Candidates optimization on MMVD [N. Park, H. Jang, J. Nam, J. Lim, S. Kim (LGE)]

[JVET-N0454](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6176) CE4-4.6: Simplification for merge list derivation in triangular prediction mode [T. Solovyev, S. Esenlik, S. Ikonin, J. Chen (Huawei)]

## CE5: Adaptive loop filtering (4)

Contributions in this category were discussed XXday XX March XXXX–XXXX (chaired by XXXqq).

JVET-N0025 Summary report …

[JVET-N0088](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5808) CE5.1: Adaptive loop filter with virtual boundary processing [C.-Y. Chen, T.-D. Chuang, C.-Y. Lai, Z.-Y. Lin, Y.-W. Huang, S.-M. Lei (MediaTek)]

[JVET-N0180](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5900) CE5-2: Loop filter line buffer reduction [A. M. Kotra, S. Esenlik, J. Chen, B. Wang, H. Gao (Huawei)]

[JVET-N0242](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5962) CE5: Results of tests CE5-3.1, CE5-3.2, CE5-3.3 and CE5-3.4 on Non-Linear Adaptive Loop Filter [J. Taquet, P. Onno, C. Gisquet, G. Laroche (Canon)]

[JVET-N0415](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6137) CE5: Coding tree block based adaptive loop filter (CE5-4) [N. Hu, V. Seregin, H. E. Egilmez, M. Karczewicz (Qualcomm)]

## CE6: Transforms and transform signalling (4)

Contributions in this category were discussed XXday XX March XXXX–XXXX (chaired by XXXqq).

[JVET-N0026](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6235) CE6: Summary Report on Transforms and Transform Signaling [X. Zhao, H.E. Egilmez]

[JVET-N0053](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5773) CE6: 2-mode MTS (CE6-2.1) [J. Lainema (Nokia)]

[JVET-N0193](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5913) CE6: Reduced Secondary Transform (RST) (CE6-3.1) [M. Koo, M. Salehifar, J. Lim, S. Kim (LGE)]

[JVET-N0360](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6081) CE6-1: Unification between MTS and Transform Skip mode [X. Zhao, X. Li, S. Liu (Tencent)]

[JVET-N0490](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6212) CE6: Transform Simplification (CE6-2.3a-c) [C. Hollmann, D. Saffar, J. Ström, P. Wennersten (Ericsson)]

## CE7: Quantization and coefficient coding (4)

Contributions in this category were discussed XXday XX March XXXX–XXXX (chaired by XXXqq).

JVET-N0027 Summary report …

[JVET-N0054](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5774) CE7: Joint coding of chrominance residuals (CE7-1) [J. Lainema (Nokia)]

[JVET-N0188](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5908) CE7-7.3: Unified rice parameter derivation for coefficient level coding [Y. Piao, K. Choi (Samsung)]

[JVET-N0345](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6066) CE7: Template based Rice parameter derivation for coding of abs\_remainder (CE7-4) [Y.-H. Chao, M. Coban, M. Karczewicz (Qualcomm)]

[JVET-N0361](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6082) CE7-2: Reduced number of context-coded bins [X. Zhao, X. Li, S. Liu (Tencent)]

## CE8: Screen content coding tools (9)

Contributions in this category were discussed XXday XX March XXXX–XXXX (chaired by XXXqq).

[JVET-N0028](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6272) CE8: Summary Report on Screen Content Coding Tools [X. Xu, Y.-C. Chao, Y.-C. Sun, J. Xu]

[JVET-N0214](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5934) CE8: BDPCM with harmonized residual coding and CCB limitation (CE8-3.1a, CE8-3.1b, CE8-5.1a, CE8-5.1b) [G. Clare (bcom), F. Henry (Orange), B. Bross, T. Nguyen, P. Keydel, H. Schwarz, D. Marpe, T. Wiegand (HHI), M. Xu, X. Li, X. Xu, M. Gao, S. Liu (Tencent)]

[JVET-N0255](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5976) CE8: Combination of MMVD and IBC mode (test 1.3a and 1.3b) [Y. Li, Z. Chen (Wuhan Univ.), X. Xu, X. Li, S. Liu (Tencent)]

[JVET-N0527](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6254) Crosscheck of JVET-N0255 (CE8-1.3a and CE8-1.3b) [G. Venugopal (HHI)] [miss] [late]

[JVET-N0280](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6001) CE8: Residual Coding for Transform Skip Mode (CE8-4.3a, CE8-4.3b, CE8-4.4a, and CE8-4.4b) [B. Bross, T. Nguyen, H. Schwarz, D. Marpe, T. Wiegand (HHI)]

[JVET-N0344](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6065) CE8: Palette Mode in HEVC (CE8-2.1) [Y.-H. Chao, V. Seregin, M. Karczewicz (Qualcomm), Y.-C. Sun, T.-S. Chang, J. Lou (Alibaba)]

[JVET-N0404](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6126) CE8: Palette Mode Improvements (CE8-2.2) [Y.-C. Sun, T.-S. Chang, J. Lou (Alibaba), Y.-H. Chao, V. Seregin, M. Karczewicz (Qualcomm), R. Chernyak, S. Ikonin, J. Chen (Huawei)]

[JVET-N0428](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6150) CE8-4.1: Rearrangement of the residual block for transform skip [S. Yoo, J. Choi, J. Heo, J. Choi, L. Li, J. Lim, S. Kim (LGE)]

[JVET-N0429](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6151) CE8-4.2: Residual Coding for transform skip with various maximum context coded bins [S. Yoo, J. Choi, J. Heo, J. Choi, J. Lim, S. Kim (LGE)]

[JVET-N0596](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6333) Cross-chreck of JVET-N0429 (CE8-4.2: Residual Coding for transform skip with various maximum context coded bins) [F. Henry (Orange)] [miss] [late]

[JVET-N0457](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6179) CE8-1.1: Block vector prediction for IBC [J. Nam, J. Lim, S. Kim (LGE)]

[JVET-N0458](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6180) CE8-1.2: Block vector coding for IBC [J. Nam, J. Lim, S. Kim (LGE)]

## CE9: Decoder motion vector derivation (7)

Contributions in this category were discussed XXday XX March XXXX–XXXX (chaired by XXXqq).

JVET-N0029 Summary report …

[JVET-N0177](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5897) CE9: Disabling SAD based early termination of BDOF (CE9-2.1) [S. Esenlik, B. Wang, A. M. Kotra, H. Gao, J. Chen (Huawei), K. Kondo, M. Ikeda, T. Suzuki (Sony)]

[JVET-N0178](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5898) CE9: Implicit splitting of BDOF application region (CE9-2.4 and CE9-2.6) [H. Chen, X. Ma, S. Esenlik, H. Yang, J. Chen (Huawei)]

[JVET-N0187](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5907) CE9-2.2: On early termination of BDOF [K. Kondo, M. Ikeda, T. Suzuki (Sony)]

[JVET-N0198](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5918) CE9: Simplification of BDOF’s optical flow parameter derivation (Test 9.2.5) [J. Li, C.-W. Kuo, C. S.Lim (Panasonic)]

[JVET-N0270](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5991) CE9-2.3: Modifications on BDOF [H. Liu, L. Zhang (Bytedance)]

[JVET-N0291](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6012) CE9: Results of DMVR related Tests CE9-1.2 [S. Sethuraman (Ittiam)]

[JVET-N0407](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6129) CE9: Removal of 4xN/8x8 CUs and Boundary Padding Process from DMVR (Test 9.1.1) [C.-C. Chen, W.-J. Chien, M. Karczewicz (Qualcomm)]

## CE10: Combined intra/inter prediction (X)

Contributions in this category were discussed XXday XX March XXXX–XXXX (chaired by XXXqq).

[JVET-N0030](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6294) CE10: Summary Report on Combined Inter and Intra Prediction [C.-W. Hsu, M. Winken]

[JVET-N0298](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6019) CE10: CIIP using explicit signaling of weights (CE10-1.2) [A. Seixas Dias, G. Kulupana, S. Blasi (BBC)]

[JVET-N0302](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6023) CE10: CIIP with position-independent weights (Test CE10-1.1) [L. Pham Van, G. Van der Auwera, A. K. Ramasubramonian, V. Seregin, M. Karczewicz (Qualcomm)]

## CE11: Deblocking (4)

Contributions in this category were discussed XXday XX March XXXX–XXXX (chaired by XXXqq).

JVET-N0031 Summary report …

[JVET-N0098](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5818) CE11-2.1: Deblocking for 4xN, Nx4 and 8xN and Nx8 block boundaries not aligned with 8x8 grids [K. Andersson, J. Enhorn, Z. Zhang, R. Sjöberg (Ericsson), A. M. Kotra, J. Chen, S. Esenlik, B. Wang, H. Gao, Y. Zhao (Huawei), C.-M. Tsai, C.-W. Hsu, T.-D. Chuang, C.-Y. Chen, Y.-W. Huang, S.-M. Lei (MediaTek)]

[JVET-N0181](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5901) CE11-2.3: Disabling of sub-pu deblocking [A. M. Kotra, S. Esenlik, J. Chen, B. Wang, H. Gao (Huawei)]

[JVET-N0463](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6185) CE11-2.2 Disable deblocking filter for 4xN for vertical edge and Nx4 for Horizontal edge on 4x4 grid [H. Jang, J. Nam, J. Lim, S. Kim (LGE)]

[JVET-N0595](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6332) CE11-1.1: Further information on conditionally signaled very strong deblocking [C. Helmrich (HHI)] [late]

## CE12: Tile set boundary motion compensation handling (2)

Contributions in this category were discussed XXday XX March XXXX–XXXX (chaired by XXXqq).

JVET-N0032 Summary report …

[JVET-N0109](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5829) CE12/AHG12: Treating boundaries of independent tile groups as picture boundaries [Hendry, S. Hong, J. Chen, Y.-K. Wang (Huawei)]

[JVET-N0356](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6077) CE12-2: Encoder-side tile group restriction [R. Skupin, Y. Sanchez, V. George, K. Sühring, T. Schierl (HHI)] [late]

## CE13: Neural-network based loop filtering (5)

Contributions in this category were discussed XXday XX March XXXX–XXXX (chaired by XXXqq).

[JVET-N0033](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6303) CE13: Summary Report on Neural Network based Filter for Video Coding [Y. Li, S. Liu, K. Kawamura]

[JVET-N0110](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5830) CE13-1.1: Convolutional neural network loop filter [Y.-L. Hsiao, O. Chubach, C.-Y. Chen, T.-D. Chuang, C.-W. Hsu, Y.-W. Huang, S.-M. Lei (MediaTek)]

[JVET-N0169](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5889) CE13-2.1: Convolutional Neural Network Filter (CNNF) for Intra Frame [?? (??)]

[JVET-N0254](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5975) CE13: Dense Residual Convolutional Neural Network based In-Loop Filter (Test 2.2 and 2.3) [Y. Wang, Z. Chen, Y. Li (Wuhan Univ.), L. Zhao, S. Liu, X. Li (Tencent)]

[JVET-N0480](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6202) CE13-1.2: Adaptive convolutional neural network loop filter [H. Yin, R. Yang, X. Fang, S. Ma (??)]

[JVET-N0513](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6239) CE13: Experimental results of CNN-based In-Loop Filter [Y. Dai, D. Liu, N. Yan, F. Wu (USTC)] [miss] [late]

# Non-CE Technology proposals

## CE1 related – Post-prediction and post-reconstruction filtering (10)

Contributions in this category were discussed XXday XX March XXXX–XXXX (chaired by XXXqq).

[JVET-N0144](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5864) Non-CE1: Simplification of division calculation in local illumination compensation [Y. Yasugi, T. Ikai (Sharp)]

[JVET-N0556](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6285) Crosscheck of JVET-N0144 (Non-CE1: Simplification of division calculation in local illumination compensation) [K. Abe (Panasonic)] [miss] [late]

[JVET-N0171](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5891) CE1-related: Combination of LIC and affine [H. Chen, X. Ma, H. Yang, J. Chen (Huawei)]

[JVET-N0206](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5926) CE1-related: Improvement of the neighboring reference samples restriction on LIC test [K. Abe, T. Toma (Panasonic)]

[JVET-N0570](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6304) Crosscheck of JVET-N0206 (CE1-related: Improvement of the neighboring reference samples restriction on LIC test) [V. Seregin (Qualcomm)] [miss] [late]

[JVET-N0304](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6025) CE1-related: combined bi-directional LIC and post-reconstruction filters mutually exclusive [P. Bordes, F. Urban, F. Galpin (Technicolor)]

[JVET-N0552](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6281) Crosscheck of JVET-N0304 (CE1-related: combined bi-directional LIC and post-reconstruction filters mutually exclusive) [T. Chujoh, T. Ikai (Sharp)] [miss] [late]

[JVET-N0620](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6362) Crosscheck of JVET-N0304 (CE1-related: combined bi-directional LIC and post-reconstruction filters mutually exclusive) [C.-M. Tsai (MediaTek)] [miss] [late]

[JVET-N0306](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6027) non-CE1: simplification of LIC parameters derivation [P. Bordes, F. Urban, F. Galpin (Technicolor)]

[JVET-N0538](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6266) Crosscheck of JVET-N0306 (non-CE1: simplification of LIC parameters derivation) [Y. He (InterDigital)] [miss] [late]

[JVET-N0307](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6028) CE1-related: on LIC reference samples selection [P. Bordes, F. Urban, F. Galpin (Technicolor)]

[JVET-N0410](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6132) CE1-related: Simplification of LIC parameter derivation and its unification with CCLM [A. Filippov, V. Rufitskiy, J. Chen (Huawei)]

[JVET-N0479](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6201) CE1-related: Hadamard transform domain in-loop filter also using bottom/right reconstructed samples [S. Ikonin, V. Stepin, A. Karabutov, J. Chen (Huawei)]

[JVET-N0482](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6204) CE1-related: Additional test results for CE1-7 tests [D. Rusanovskyy, K. Reuze, M. Karczewicz (Qualcomm)]

[JVET-N0493](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6215) CE1-related: Multiplication-free bilateral loop filter [J. Ström, P. Wennersten, J. Enhorn, R. Sjöberg (Ericsson)]

## CE2 related – Subblock motion compensation (16)

Contributions in this category were discussed XXday XX March XXXX–XXXX (chaired by XXXqq).

[JVET-N0079](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5799) CE2-related: Applying SMR to subblock-based merging candidate list [Y.-C. Lin, C.-C. Chen, M.-S. Chiang, C.-W. Hsu, Y.-W. Huang, S.-M. Lei (MediaTek)]

[JVET-N0599](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6339) Crosscheck of JVET-N0079 (CE2-related: Applying SMR to subblock-based merging candidate list) [Y. Han, W.-J. Chien (Qualcomm)] [miss] [late]

[JVET-N0199](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5919) CE2-related: combined test of affine memory bandwidth complexity reduction (Test2.4.6+Test2.4.8) [J. Li, C.-W. Kuo, C. S.Lim (Panasonic), M. Zhou (Broadcom)]

[JVET-N0235](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5955) CE2-related: Symmetric MVD signalling [J. Luo, Y. He (InterDigital)]

[JVET-N0618](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6360) Crosscheck of JVET-N0235 on improvements on bi-directional optical flow [X. Li (Tencent)] [miss] [late]

[JVET-N0236](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5956) CE2-related: Prediction refinement with optical flow for affine mode [J. Luo, Y. He (InterDigital)]

[JVET-N0266](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5987) CE2-related: Disabling bi-prediction or inter prediction for small blocks [H. Liu, L. Zhang (Bytedance)]

[JVET-N0268](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5989) CE2-related: Remove above-left affine inherited motion vector predictor [H. Huang, W.-J. Chien, M. Karczewicz (Qualcomm)]

[JVET-N0546](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6275) Crosscheck of JVET-N0268 (CE2-related: Remove above-left affine inherited motion vector predictor) [H. Chen (Huawei)] [miss] [late]

[JVET-N0273](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5994) CE2-related: Affine motion compensation using 2x2 subblock [H. Huang, W.-J. Chien, M. Karczewicz (Qualcomm)]

[JVET-N0547](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6276) Crosscheck of JVET-N0273 (CE2-related: Affine motion compensation using 2x2 subblock) [H. Chen (Huawei)] [miss] [late]

[JVET-N0334](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6055) CE2/4/9-related: Overflow prevention in motion field storage [X. Xiu, Y.-W. Chen, T.-C. Ma, X. Wang (Kwai Inc.)]

[JVET-N0335](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6056) CE2/4-related: unification of MV rounding [X. Xiu, Y.-W. Chen, T.-C. Ma, X. Wang (Kwai Inc.)]

[JVET-N0621](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6363) Crosscheck of JVET-N0335 (CE2/4-related: unification of MV rounding) [C.-M. Tsai (MediaTek)] [miss] [late]

[JVET-N0336](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6057) CE2/4-related: On motion field storage reduction for spatial motion prediction [X. Xiu, Y.-W. Chen, T.-C. Ma, X. Wang (Kwai Inc.)]

[JVET-N0515](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6241) Crosscheck of JVET-N0336 (CE2/4-related: On motion field storage reduction for spatial motion prediction) [Y.-L. Hsiao (MediaTek)] [miss] [late]

[JVET-N0369](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6090) CE2-related: On restriction of memory bandwidth consumption of affine mode (2x2 variant) [M. Zhou (Broadcom)]

[JVET-N0575](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6309) Crosscheck of JVET-N0369 (CE2-related: On restriction of memory bandwidth consumption of affine mode (2x2 variant)) [K. Zhang (Bytedance)] [late]

[JVET-N0399](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6121) CE2-related: Simplifications of interweaved affine mode [X. Li, G. Li, X. Xu, S. Liu (Tencent)]

[JVET-N0456](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6178) CE2-related: Affine motion model derivation method for affine merge mode [W. Chen, J. Luo, Y. He (InterDigital)]

[JVET-N0481](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6203) Non-CE2: Gbi inheritance for constructed affine merge candidate [J. Chen, R.-L. Liao, Y. Ye (Alibaba)]

[JVET-N0504](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6227) CE2-related: simplification of 2x2 subblock based affine motion compensation [H. Huang, W.-J. Chien, M. Karczewicz (Qualcomm)] [late]

[JVET-N0597](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6336) Crosscheck of JVET-N0504 (CE2-related: Simplified prediction refinement for affine motion compensation) [R.-L. Liao (Alibaba)] [miss] [late]

[JVET-N0510](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6236) CE2-related: Phase-variant affine subblock motion compensation [T.-D. Chuang, C.-Y. Chen, C.-Y. Lai, Y.-W. Huang, S.-M. Lei (MediaTek)] [late]

## CE3 related – Intra prediction and mode coding (53)

Contributions in this category were discussed XXday XX March XXXX–XXXX (chaired by XXXqq).

[JVET-N0082](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5802) CE3-related: Constrained partitioning of chroma intra CBs [Z.-Y. Lin, T.-D. Chuang, C.-Y. Chen, Y.-W. Huang, S.-M. Lei (MediaTek)]

[JVET-N0129](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5849) Non-CE3: PDPC simplification [N. Choi, M. W. Park, K. Choi (Samsung)]

[JVET-N0132](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5852) Non-CE3: Simplification of DC Prediction [J.-Y. Huo, J.-L. Wang, X.-W. Li, Y.-Z. Ma, W. Zhang, F.-Z. Yang (Xidian Univ.), S. Wan (NPU), Y.-F. Yu, Y. Liu (OPPO)]

[JVET-N0139](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5859) CE3-related: Intra Angular Prediction and Modified PDPC Based on Two Reference Lines [D. Jiang, J. Lin, F. Zeng, C. Fang (Dahua)]

[JVET-N0143](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5863) Non-CE3: Simplification of multi-line intra [T. Hashimoto, E. Sasaki, T. Ikai (Sharp)]

[JVET-N0151](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5871) CE3-related: Modified Chroma Derived Mode [D. Jiang, J. Lin, F. Zeng, C.Fang (Dahua)]

[JVET-N0154](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5874) Non-CE3: Chroma Intra Default Modes Modification Based on Order of Luminance Modes [[D. Jiang](mailto:jiang_dong@dahuatech.com), [J. Lin](mailto:lin_jucai@dahuatech.com), [F. Zeng](mailto:zeng_feiyang@dahuatech.com), C. Fang (Dahua)]

[JVET-N0155](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5875) Non-CE3: Chroma Intra Default Modes Modification Based on Statistics of Luminance Modes [D. Jiang, J. Lin, F. Zeng, C. Fang (Dahua)]

[JVET-N0157](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5877) Non-CE3: MPM List Modification for Zero Reference Line [D. Jiang, J. Lin, F. Zeng, C. Fang (Dahua)]

[JVET-N0159](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5879) Non-CE3: Relaxation method of processing dependency in ISP for small blocks [K. Unno, K. Kawamura, Y. Kidani, S. Naito (KDDI)]

[JVET-N0530](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6258) Crosscheck of JVET-N0159 (Non-CE3: Relaxation method of processing dependency of ISP for small blocks) [S. De- Luxán-Hernández (HHI)] [miss] [late]

[JVET-N0164](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5884) CE3-related: Size restriction for CCLM [F. Chen, L. Wang (Hikvision)]

[JVET-N0563](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6295) Crosscheck of JVET-N0164 (CE3-related: Size restriction for CCLM) [J. Choi (LGE)] [miss] [late]

[JVET-N0170](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5890) CE3-related: Explicitly signal non angular modes with encoding changes [J. Yao, J. Zhu, W. Cai, K. Kazui (Fujitsu)] [late]

[JVET-N0183](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5903) Non-CE3: Shared MPM list [A. M. Kotra, S. Esenlik, J. Chen, B. Wang, H. Gao (Huawei)]

[JVET-N0185](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5905) CE3-related: A unified MPM list for intra mode coding [B. Wang, A. M. Kotra, S. Esenlik, H. Gao, J. Chen (Huawei)]

[JVET-N0186](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5906) CE3-related: Simplification on Intra sub-partition coding mode [B. Wang, A. M. Kotra, S. Esenlik, H. Gao, J. Chen (Huawei)]

[JVET-N0215](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5935) Non-CE3: Intra prediction mode restriction in small blocks [D. Y. Lee, T. H. Kim, G. H. Park (KHU)]

[JVET-N0216](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5936) Non-CE3: Determination of wide-angle mode using the size of a coding block [D. Kim, J. Jung, G. Ko, J. Son, J. Kwak (WILUS)]

[JVET-N0218](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5938) CE3-related: Chroma Intra Mode Coding with Lumped Luma Directions and Replacement for DM mode [J. Park, B. Jeon (SKKU)]

[JVET-N0222](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5942) CE3-related: CIIP intra mode propagation to intra block [L. Li, J. Nam, J. Heo, J. Lim, S. Kim (LGE)]

[JVET-N0223](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5943) CE3-related: reference sample filtering simplification [L. Li, J. Heo, J. Lim, S. Kim (LGE)]

[JVET-N0224](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5944) CE3-related: ISP support for 4:2:2 and 4:4:4 [L. Li, M. Koo, J. Heo, J. Nam, J. Lim, S. Kim (LGE)]

[JVET-N0229](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5949) Non-CE3: CCLM prediction for 4:2:2 and 4:4:4 color format [J. Choi, J. Heo, J. Lim, S. Kim (LGE)]

[JVET-N0230](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5950) Non-CE3: Simplified intra mode candidates for ISP [J. Choi, J. Heo, S. Yoo, L. Li, J. Choi, J. Lim, S. Kim (LGE)]

[JVET-N0248](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5968) Non-CE3: Combined-Hypothesis Intra-Prediction with Unified Intra Mode Coding [G. Kulupana, A. Seixas Dias, S. Blasi (BBC)]

[JVET-N0303](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6024) CE3-related: Simplified unified luma intra mode coding [S. Blasi, A. Seixas Dias, G. Kulupana (BBC)]

[JVET-N0305](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6026) CE3-related: Luma intra mode coding with restricted MPM derivation [S. Blasi, A. Seixas Dias, G. Kulupana (BBC)]

[JVET-N0531](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6259) Crosscheck of JVET-N0305 (CE3-related: Luma intra mode coding with restricted MPM derivation) [S. De-Luxán-Hernández (HHI)] [miss] [late]

[JVET-N0308](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6029) AHG16/Non-CE3: Restriction of the maximum CU size for ISP to 64x64 [S. De-Luxán-Hernández, B. Bross, T. Nguyen, V. George, B. Stabernack, H. Schwarz, D. Marpe, T. Wiegand (HHI)]

[JVET-N0313](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6034) CE3-related: Low latency intra sub-partitions [R. Vanam, Y. He (InterDigital)]

[JVET-N0330](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6051) Non-CE3: Intra sub-partition coding without thin partitions [T.-C. Ma, X. Xiu, Y.-W. Chen, X. Wang (Kwai Inc.)]

[JVET-N0333](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6054) CE3-related: MMLM only cross-component prediction [H.-J. Jhu, Y.-W. Chen, X. Wang (Kwai Inc.)]

[JVET-N0607](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6348) Cross-check of JVET-N0333, "CE3-related: MMLM only cross-component prediction" [?? (??)] [miss] [late]

[JVET-N0339](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6060) Non-CE3: Unification on WAIP for normal and ISP intra prediction [T.-C. Ma, X. Xiu, Y.-W. Chen, X. Wang (Kwai Inc.)]

[JVET-N0581](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6315) Crosscheck of JVET-N0339 (Non-CE3: Unification on WAIP for normal and ISP intra prediction) [J. Heo, H. Jang, J. Lim, S. Kim (LGE)] [late]

[JVET-N0358](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6079) Non-CE3: Harmonization of CBF coding for intra sub-partition coding mode [Z. Zhang, K. Andersson, R. Sjöberg (Ericsson)]

[JVET-N0371](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6093) Non-CE3: directional intra prediction with varying angle [G. Rath, F. Urban, F. Racapé (Technicolor)]

[JVET-N0591](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6325) Crosscheck of JVET-N0371 (Non-CE3: directional intra prediction with varying angle) [P. Merkle (HHI)] [late]

[JVET-N0372](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6094) Non-CE3: ISP with independent sub-partitions for certain block sizes [S. De-Luxán-Hernández, B. Bross, T. Nguyen, V. George, B. Stabernack, H. Schwarz, D. Marpe, T. Wiegand (HHI)]

[JVET-N0536](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6264) Crosscheck of JVET-N0372 (Non-CE3: ISP with independent sub-partitions for certain block sizes) [X. Zhao (Tencent)] [miss] [late]

[JVET-N0376](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6098) AHG16/CE3-related: CCLM mode restriction for increasing decoder throughput [J.-Y. Jung, Y.-L. Lee (Sejong Univ.), D.-Y. Kim, W. J. Jeong (Chips&Media), S.-C. Lim, J. Kang (ETRI)]

[JVET-N0390](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6112) AHG16/non-CE3: Study of CCLM restrictions in case of separate luma/chroma tree [E. François, F. Galpin, F. Le Léannec, T. Poirier (Technicolor)]

[JVET-N0394](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6116) CE3-related: Unified MPM list based on CE3-3.3 and CE3-3.5.1 [L. Zhao, X. Zhao, X. Li, S. Liu (Tencent)]

[JVET-N0583](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6317) Cross-check of JVET-N0394: CE3-related: Unified MPM list based on CE3-3.3 and CE3-3.5.1 [X. Xiu (Kwai Inc.)] [miss] [late]

[JVET-N0396](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6118) CE3-related: Enabling parallel reconstruction of small intra-coded blocks [L. Pham Van, G. Van der Auwera, A. K. Ramasubramonian, V. Seregin, H. Huang, M. Karczewicz (Qualcomm)]

[JVET-N0401](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6123) Non-CE3/Non-CE8: Enable Transform Skip in CUs using ISP [S. De-Luxán-Hernández, T. Nguyen, B. Bross, H. Schwarz, D. Marpe, T. Wiegand (HHI)]

[JVET-N0412](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6134) CE3-related: Modification on the intra luma mode coding process [Y. Kidani, K. Kawamura, K. Unno, S. Naito (KDDI)]

[JVET-N0426](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6148) Non-CE3: History-based intra MPM default angular modes derivation [Z. Zhang, P. Wennersten, R. Yu, J. Ström, R. Sjöberg (Ericsson)]

[JVET-N0427](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6149) CE3-related: Harmonization between ISP and WAIP [L. Zhao, X. Zhao, X. Li, S. Liu (Tencent)] [late]

[JVET-N0432](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6154) AHG16/Non-CE3: On 1xN and 2xN subpartitions in intra subpartition coding [A. K. Ramasubramonian, G. Van der Auwera, T. Hsieh, V. Seregin, L. Pham Van, M. Karczewicz]

[JVET-N0433](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6155) CE3-related: Unification of MPM derivation for luma intra modes [A. K. Ramasubramonian, G. Van der Auwera, L. Pham Van, M. Karczewicz (Qualcomm)]

[JVET-N0562](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6293) Crosscheck of JVET-N0433 (CE3-related: Unification of MPM derivation for luma intra modes) [M. G. Sarwer (MediaTek)] [miss] [late]

[JVET-N0435](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6157) Non-CE3: Harmonization between WAIP and intra smoothing filters [P.-H. Lin, Y.-C. Yang (Foxconn)]

[JVET-N0437](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6159) Non-CE3: On allowing non-MPM modes for ISP and non-zero reference line [F. Bossen, K. Misra (Sharp Labs of America)]

[JVET-N0450](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6172) CE3-3.4-related: unified MPM list construction [F. Bossen, K. Misra (Sharp)]

[JVET-N0452](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6174) Non-CE3: Harmonization between WAIP and ISP [J. Heo, H. Jang, L. Li, J. Choi, J. Lim, S. Kim (LGE)]

[JVET-N0453](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6175) AHG16/Non-CE3: on chroma 2xN and Nx2 intra prediction in single tree [Y. Zhao, A. Karabutov, H. Yang, J. Chen (Huawei)]

[JVET-N0465](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6187) CE3-related: Restrict 2xN, Nx2 chroma processing for dual tree structure [H. Jang, J. Nam, N. Park, J. Lim, S. Kim (LGE)]

[JVET-N0588](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6322) Crosscheck of JVET-N0465 (CE3-related: Restrict 2xN, Nx2 chroma processing for dual tree structure) [T. Zhou (Sharp)] [miss] [late]

[JVET-N0469](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6191) CE3-related: Disable ISP mode for 128xN, Nx128 Block [H. Jang, J. Heo, J. Nam, J. Lim, S. Kim (LGE)]

[JVET-N0475](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6197) Non-CE3/6: Enabling Transform Skip for ISP [T.-C. Ma, X. Xiu, Y.-W. Chen, X. Wang (Kwai Inc.)]

[JVET-N0524](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6250) Non-CE3: Modified beta derivation in CCLM [M. Ikeda, T. Suzuki (Sony)] [miss] [late]

## CE4 related – Inter prediction and motion vector coding (40)

Contributions in this category were discussed XXday XX March XXXX–XXXX (chaired by XXXqq).

[JVET-N0084](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5804) CE4-related: Motion compression for HMVP buffers and MV line buffer [Y.-L. Hsiao, T.-D. Chuang, C.-W. Hsu, C.-Y. Chen, Y.-W. Huang, S.-M. Lei (MediaTek)]

[JVET-N0085](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5805) CE4-related: MV rounding unification [T.-D. Chuang, C.-Y. Chen, Y.-W. Huang, S.-M. Lei (MediaTek)]

[JVET-N0578](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6312) Cross-check of JVET-N0085: CE4-related: MV rounding unification [X. Xiu (Kwai Inc.)] [miss] [late]

[JVET-N0086](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5806) CE4-related: Reduction of interactions between bi-prediction coding tools [C.-C. Chen, M.-S. Chiang, C.-W. Hsu, Y.-W. Huang, S.-M. Lei (MediaTek)]

[JVET-N0539](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6267) Crosscheck of JVET-N0086: CE4-related: Reduction of interactions between bi-prediction coding tools [X. Xu (Tencent)] [miss] [late]

[JVET-N0586](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6320) Cross-check of JVET-N0086: CE4-related: Reduction of interactions between bi-prediction coding tools [H. Wang (Qualcomm)] [miss] [late]

[JVET-N0087](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5807) CE4-related: Simplification of triangle merging candidate list derivation on top of CE4-4.1c [T.-D. Chuang, C.-Y. Chen, Y.-W. Huang, S.-M. Lei (MediaTek)]

[JVET-N0126](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5846) CE4-related: Signaling MMVD syntax elements [S. Jeong, M. W. Park, K. Choi (Samsung)]

[JVET-N0127](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5847) CE4-related: MMVD enabling signaling in SPS [S. Jeong, M. Park, K. Choi (Samsung)]

[JVET-N0165](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5885) CE4-related: On spatial candidate list construction [L. Xu, F. Chen, L. Wang (Hikvision)]

[JVET-N0166](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5886) CE4-related: Advanced Multi-hypothesis Inter Prediction for bandwidth reduction in B frame [Y. Sun, F. Chen, L. Wang (Hikvision)]

[JVET-N0167](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5887) CE4-related: Advanced Multi-hypothesis Inter Prediction [Y. Sun, F. Chen, L. Wang (Hikvision)]

[JVET-N0168](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5888) CE4-related: AMVR cost calculation modification in motion estimation stage [Y. Sun, F. Chen, L. Wang (Hikvision)]

[JVET-N0200](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5920) Non-CE4: Simplification of inter MVP list generation for 4x4 block [J. Li, C.-W. Kuo, C. S.Lim (Panasonic)]

[JVET-N0557](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6288) Crosscheck of JVET-N0200 (Non-CE4: Simplification of inter MVP list generation for 4x4 block) [Y. Yasugi (Sharp)] [miss] [late]

[JVET-N0203](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5923) Non-CE4: Modification of the temporal merging candidate for the inter merge mode [G. Lee, G. Kim, S. Cha, D. Nam, J. Han (Sejong University)]

[JVET-N0567](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6300) Crosscheck of JVET-N0203 (Non-CE4: Modification of the temporal merging candidate for the inter merge mode) [H. Lee, S. -C. Lim, J. Lee, J. Kang (ETRI)] [miss] [late]

[JVET-N0213](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5933) CE4-related: Remove TMVP merge and AMVP candidate for the specified blocksizes​ [S. H. Wang (PKU), X. Zheng (DJI), S. S. Wang, S. W. Ma (PKU)] [placeholder] [late]

[JVET-N0240](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5960) Non-CE4: Simplification of merge MVD derivation [G. Ko, D. Kim, J. Jung, J. Son, J. Kwak (WILUS)]

[JVET-N0572](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6306) Crosscheck of JVET-N0240 (Non-CE4: Simplification of merge MVD derivation) [Y.-W. Chen (Kwai Inc.)] [miss] [late]

[JVET-N0265](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5986) CE4-related: Simplification of HMVP in AMVP mode [H. Huang, W.-J. Chien, M. Karczewicz (Qualcomm)]

[JVET-N0267](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5988) Non-CE4: shared merge list without double HMVP tables [L. Zhang (Bytedance)]

[JVET-N0542](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6270) Crosscheck of JVET-N0267: Non-CE4: shared merge list without double HMVP tables [X. Xu (Tencent)] [miss] [late]

[JVET-N0277](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5998) Non-CE4: Parallel friendly pair-wise merge candidate derivation [K. Zhang (Bytedance)]

[JVET-N0560](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6291) Crosscheck of JVET-N0277 (Non-CE4: Parallel-friendly pairwise average merge candidate derivation) [T. Hashimoto (Sharp)] [miss] [late]

[JVET-N0286](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6007) CE4-related: Simplified coding of the BPWA index [F. Le Léannec, Y. Chen, T. Poirier, A. Robert (Technicolor)]

[JVET-N0517](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6243) Crosscheck of JVET-N0286 (CE4-related: Simplified coding of the BPWA index) [S.-T. Hsiang (MediaTek)] [miss] [late]

[JVET-N0287](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6008) CE4-related: Simplified coding of the MVP index [F. Le Léannec, Y.Chen, T. Poirier, A. Robert (Technicolor)]

[JVET-N0602](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6343) Crosscheck of JVET-N0287 (CE4-related: Simplified coding of the MVP index) [Y. Han, W.-J. Chien (Qualcomm)] [miss] [late]

[JVET-N0309](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6030) Non-CE4: Switched half-pel interpolation filter [A. Henkel, B. Bross, M. Winken, P. Keydel, H. Schwarz, D. Marpe, T. Wiegand (HHI)]

[JVET-N0332](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6053) Non-CE4: MVD scaling issue for LTRPs [Y.-W. Chen, X. Xiu, T.-C. Ma, X. Wang (Kwai Inc.)]

[JVET-N0340](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6061) CE4-related: An improved method for triangle merge list construction [X. Wang, Y.-W. Chen, X. Xiu, T.-C. Ma (Kwai Inc.)]

[JVET-N0587](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6321) Cross-check of JVET-N0340: CE4-related: An improved method for triangle merge list construction [H. Wang (Qualcomm)] [miss] [late]

[JVET-N0373](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6095) Non-CE4: HMVP unification between the Merge and MVP list [H. Lee, J. Kang, S.-C. Lim, J. Lee, H. Y. Kim (ETRI)]

[JVET-N0380](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6102) CE4-related: Fix of MMVD signalling [G. Li, X. Li, X. Xu, S. Liu (Tencent)]

[JVET-N0385](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6107) CE4-related: modification of HMVP update process inside the shared merging candidate list region [X. Xu, X. Li, G. Li, S. Liu (Tencent)]

[JVET-N0606](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6347) Crosscheck of JVET-N0385 (Non-CE4: modification of HMVP update process inside the shared merging candidate list region) [N. Zhang, H. Liu (Bytedance)] [miss] [late]

[JVET-N0400](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6122) CE4-related: Signaling of maximum number of triangle candidates [X. Li, G. Li, X. Xu, S. Liu (Tencent)]

[JVET-N0434](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6156) Non-CE4: Unified context model of AMVR and Affine AMVR [Y.-C. Yang, P.-H. Lin (Foxconn)]

[JVET-N0439](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6161) CE4-related: supplementary information regarding CE4-4.4 [L. Zhang, K. Zhang, H. Liu, J. Xu, Y. Wang (Bytedance)]

[JVET-N0447](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6169) Non-CE4: On triangle merge mode [Y.-J. Chang, C.-C. Chen, W.-J. Chien, M. Karczewicz (Qualcomm)]

[JVET-N0622](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6364) Crosscheck of JVET-N0447 on triangle merge mode [X. Li (Tencent)] [miss] [late]

[JVET-N0448](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6170) Non-CE4: On MMVD signaling [Y.-J. Chang, W.-J. Chien, C.-C. Chen, M. Karczewicz (Qualcomm)]

[JVET-N0449](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6171) CE4-related: Simplification on MMVD distance table [Y. Zhang, Y.-J. Chang, C.-C. Chen, W.-J. Chien, M. Karczewicz (Qualcomm)]

[JVET-N0462](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6184) Non-CE4: Mismatch between text specification and reference software on inter prediction mode [J. Nam, H. Jang, N. Park, J. Lim, S. Kim (LGE)]

[JVET-N0471](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6193) Non-CE4: Simplication of decoding process for SMVD reference indices [H. Lee, J. Kang, S.-C. Lim, J. Lee, H. Y. Kim (ETRI)]

[JVET-N0476](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6198) Non-CE4: Constraints of picture size in VVC [Y.-W. Chen, X. Xiu, T.-C. Ma, X. Wang (Kwai Inc.)]

[JVET-N0483](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6205) Non-CE4: Simplification of triangle partition and SBT combination [R.-L. Liao, Y. Ye, J. Chen (Alibaba)]

[JVET-N0598](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6338) Crosscheck of JVET-N0483: Non-CE4: Simplification of triangle partition and SBT combination [C.-H. Hung, W.-J. Chien (Qualcomm)] [late]

[JVET-N0486](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6208) CE4-related: Simplification for share merge list and HMVP harmonization process [S.H. Wang (PKU), X. Zheng (DJI), S.S. Wang, S.W. Ma (PKU)]

[JVET-N0487](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6209) CE4-related: Further simplification of triangle prediction merging candidate list derivation [X.W. Meng (PKU), X. Zheng (DJI), S.S. Wang, S.W. Ma (PKU)]

[JVET-N0499](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6221) CE4-related: Simplification for merge list derivation in triangular prediction mode on top of test CE4-4.6.b [T. Solovyev, S. Esenlik, S. Ikonin, J. Chen (Huawei)]

[JVET-N0500](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6222) Non-CE4: Restrictions on triangular merge list size [T. Solovyev, S. Esenlik, S. Ikonin, J. Chen (Huawei)] [late]

[JVET-N0525](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6252) CE4-related: CE4-4.5 pruning reduction in TPM using regular merge candidates [A. Robert, T. Poirier, F. Le Léannec, F. Galpin (Technicolor)] [late]

## CE5 related – Adaptive loop filtering (3)

Contributions in this category were discussed XXday XX March XXXX–XXXX (chaired by XXXqq).

[JVET-N0243](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5963) Non-CE5: Complementary results of tests CE5-3 on Non-Linear ALF [J. Taquet, P. Onno, C. Gisquet, G. Laroche (Canon)]

[JVET-N0416](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6138) CE5-related: Unification of picture boundary and line buffer handling for ALF [N. Hu, V. Seregin, M. Karczewicz (Qualcomm)]

[JVET-N0545](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6274) Crosscheck of JVET-N0416 (CE5-related: Unification of picture boundary and line buffer handling for ALF) [C.-Y. Chen (MediaTek)] [miss] [late]

[JVET-N0488](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6210) CE5-related: Syntax redundancy removal in adaptive loop filter [X.W. Meng (PKU), X. Zheng (DJI), C.M. Jia, S.S. Wang, S.W. Ma (PKU)]

[JVET-N0569](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6302) Crosscheck of JVET-N0488 (CE5-related: Syntax redundancy removal in adaptive loop filter) [W. Choi (Samsung)] [miss] [late]

## CE6 related – Transforms and transform signalling (26)

Contributions in this category were discussed XXday XX March XXXX–XXXX (chaired by XXXqq).

[JVET-N0089](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5809) CE6-related: Unified implicit MTS between ISP mode and regular intra mode [M.-S. Chiang, C.-W. Hsu, Y.-W. Huang, S.-M. Lei (MediaTek)]

[JVET-N0565](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6297) Crosscheck of JVET-N0089 (CE6-related: Unified implicit MTS between ISP mode and regular intra mode) [Y. Sun, F. Chen, L. Wang (Hikvision)] [miss] [late]

[JVET-N0105](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5825) CE6-related: RST binarisation [C. Rosewarne, J. Gan (Canon)]

[JVET-N0121](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5841) Non-CE6: MTS simplification [T. Tsukuba, Y. Yagasaki, T. Suzuki (Sony)]

[JVET-N0122](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5842) CE6/CE8-related: Alternative implementation of residual rearrangement for transform skipped blocks [T. Tsukuba, M. Ikeda, T. Suzuki (Sony)] [placeholder] [late]

[JVET-N0123](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5843) Non-CE6/CE8: Chroma Transform Skip [T. Tsukuba, M. Ikeda, T. Suzuki (Sony)]

[JVET-N0534](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6262) Crosscheck of JVET-N0123 (AHG13/Non-CE6/CE8: Chroma Transform Skip) [X. Zhao (Tencent)] [miss] [late]

[JVET-N0160](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5880) CE6-related: Simplification on transform selection for Intra Sub-Partitions [X. Cao, L. Xu, F. Chen, L. Wang (Hikvision)]

[JVET-N0535](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6263) Crosscheck of JVET-N0160 (Non-CE6: Simplification on transform selection for Intra Sub-Partitions) [X. Zhao (Tencent)] [miss] [late]

[JVET-N0161](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5881) CE6-related: Implicit transform selection based on intra mode [X. Cao, F. Chen, L. Wang (Hikvision)]

[JVET-N0172](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5892) Non-CE6: Unification of Implicit Transform Core Selection [H. Gao, S. Esenlik, B. Wang, A. M. Kotra, J. Chen (Huawei)]

[JVET-N0190](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5910) Non-CE6: Modifications on sub-block transform [J. Jung, D. Kim, G. Ko, J. Son, J. Kwak (WILUS)]

[JVET-N0194](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5914) CE6-related: Context selection of last non-zero coefficient position coding based on reduced TU size (related to JVET-M0297 and JVET-M0251/M0257) [M. Koo, J. Choi, M. Salehifar, J. Lim, S. Kim (LGE)]

[JVET-N0208](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5928) CE6-6.2: Simplification related to MTS with reduced modes [K. Choi, M. Park, M. W. Park, W. Choi (Samsung)]

[JVET-N0338](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6059) Non-CE6: Unified transform selection for implicit MTS [T.-C. Ma, X. Xiu, Y.-W. Chen, X. Wang (Kwai Inc.)]

[JVET-N0362](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6083) Non-CE6: Configurable max transform size in VVC [X. Zhao, X. Li, S. Liu (Tencent)]

[JVET-N0363](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6084) CE6-related: Modified encoder decision for transform skip [X. Zhao, X. Li, S. Liu (Tencent)]

[JVET-N0364](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6085) Non-CE6: Further cost reduction for primary transform [X. Zhao, X. Li, S. Liu (Tencent)]

[JVET-N0365](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6086) CE6-related: MPM based non-separable secondary transform [X. Zhao, X. Li, S. Liu (Tencent)]

[JVET-N0518](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6244) Crosscheck of JVET-N0365 (CE6-related: MPM based non-separable secondary transform) [P. Philippe (Orange bcom)] [miss] [late]

[JVET-N0375](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6097) Non-CE6: Simplification on implicit transform selection in ISP mode [S.-C. Lim, J. Kang, J. Lee, H. Lee, H. Y. Kim (ETRI)]

[JVET-N0388](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6110) Non-CE6: Shape Adaptive Transform Selection for ISP, SBT and MTS [K. Naser, T. Poirier, F. Le Léannec (Technicolor)]

[JVET-N0419](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6141) Non-CE6: A Simplification of Implicit MTS [H. E. Egilmez, A. Said, N. Hu, C.-H. Hung, V. Seregin, M. Karczewicz (Qualcomm)]

[JVET-N0420](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6142) Non-CE6: A Simplification of Implicit Transform Selection in Intra-subblock Partitioning [H. E. Egilmez, A. K. Ramasubramonian, A. Said, N. Hu, V. Seregin, G. Van der Auwera, M. Karczewicz (Qualcomm)]

[JVET-N0424](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6146) CE6-related: Simplification of MTS for intra-CUs [C.-H. Hung, H. E. Egilmez, N. Hu, V. Seregin, M. Karczewicz (Qualcomm)]

[JVET-N0519](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6245) Crosscheck of JVET-N0424 (CE6-related: An Explicit MTS Design with Fast Encoder) [P. Philippe (Orange bcom)] [miss] [late]

[JVET-N0445](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6167) Non-CE6: MTS kernel derivation for efficient memory usage [S. Shrestha, A. Kumar, B. Lee (Chosun Univ.), Y. Lee, J. Park (Humax)]

[JVET-N0485](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6207) Non-CE6: Efficient separable Multi-Transform-Signalling (MTS) without zero-out [A. Said, H.E. Egilmez, Y.-H. Chao, V. Seregin, M. Karczewicz (Qualcomm)]

[JVET-N0491](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6213) CE6-related: Transform Candidate Ordering [[C. Hollmann](mailto:christopher.hollmann@ericsson.com), [D. Saffar](mailto:davood.saffar@ericsson.com), [J. Ström](mailto:jacob.strom@ericsson.com), [P. Wennersten (Ericsson)](mailto:per.wennersten@ericsson.com)]

[JVET-N0509](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6234) CE6-Related: NSST with 8 Coefficients Computation [K. Naser, G. Rath, P. de Lagrange (Technicolor)] [late]

[JVET-N0555](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6284) CE6-related: Simplification of the Reduced Secondary Transform [M. Siekmann, M. Winken, H. Schwarz, D. Marpe, T. Wiegand (HHI)] [late]

## CE7 related – Quantization and coefficient coding (11)

Contributions in this category were discussed XXday XX March XXXX–XXXX (chaired by XXXqq).

[JVET-N0090](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5810) CE7-related: Support of signalling default and user-defined scaling matrices [O. Chubach, C.-Y. Lai, C.-Y. Chen, T.-D. Chuang, C.-W. Hsu, Y.-W. Huang, S.-M. Lei (MediaTek)]

[JVET-N0091](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5811) CE7-related: TB-level constraints on context-coded bins for coefficient coding [T.-D. Chuang, S.-T. Hsiang, Z.-Y. Lin, C.-Y. Chen, Y.-W. Huang, S.-M. Lei (MediaTek)]

[JVET-N0092](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5812) CE7-related: Unified Rice parameter derivation of abs\_remainder and dec\_abs\_level syntax elements [M. G. Sarwer, O. Chubach, C.-W. Hsu, Y.-W. Huang, S.-M. Lei (MediaTek)]

[JVET-N0103](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5823) CE7-related: Coefficient group size harmonisation [C. Rosewarne, J. Gan (Canon)]

[JVET-N0106](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5826) CE7-related: TU level limits on context-coded bins for coefficient coding [M. Coban, M. Karczewicz (Qualcomm)]

[JVET-N0189](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5909) Non-CE7: Unified last position coding for 32-point transforms [Y. Piao, K. Choi (Samsung)]

[JVET-N0533](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6261) Crosscheck of JVET-N0189 (Non-CE7: Unified last position coding for 32-point transformsNon-CE7: Unified last position coding for 32-point transforms) [X. Zhao (Tencent)] [miss] [late]

[JVET-N0281](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6002) CE7-related: Constraint on the number of regular bins per subblock [S.-T. Hsiang, T.-D. Chuang, S.-M. Lei (MediaTek)]

[JVET-N0592](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6326) Cross-check of JVET-N0281 (CE7-related: Constraint on the number of regular bins per subblock) [[F. Le Léannec](mailto:fabrice.leleannec@technicolor.com), [T. Poirier (Technicolor)](mailto:tangi.poirier@technicolor.com)] [miss] [late]

[JVET-N0282](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6003) CE7-related: Joint chroma residual coding with multiple modes [C. Helmrich, C. Rudat, T. Nguyen, H. Schwarz, D. Marpe, T. Wiegand (HHI)]

[JVET-N0326](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6047) Non-CE7: Simplification of cbf coding [Y.-W. Chen, X. Xiu, T.-C. Ma, X. Wang (Kwai Inc.)]

[JVET-N0347](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6068) CE7-related: Joint coding of chroma residuals [G. Van der Auwera, A. K. Ramasubramonian, M. Coban, M. Karczewicz (Qualcomm)]

[JVET-N0573](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6307) Crosscheck of JVET-N0347 (CE7-related: Joint coding of chroma residuals) [Y.-W. Chen (Kwai Inc.)] [miss] [late]

[JVET-N0492](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6214) CBF flags signalling in VVC [R. Chernyak, Y. Zhao, S. Ikonin, J. Chen (Huawei)]

## CE8 related – Screen content coding tools (40)

Contributions in this category were discussed XXday XX March XXXX–XXXX (chaired by XXXqq).

[JVET-N0093](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5813) CE8-related: Disallowing coexistence of regular merge and IBC merge in SMR [Y.-C. Lin, C.-C. Chen, M.-S. Chiang, C.-W. Hsu, Y.-W. Huang, S.-M. Lei (MediaTek)]

[JVET-N0601](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6341) Crosscheck of JVET-N0093 (CE8-related: Disallowing coexistence of regular merge and IBC merge in SMR) [Y. Han, W.-J. Chien (Qualcomm)] [miss] [late]

[JVET-N0094](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5814) CE8-related: Context modelling of transform skip mode [M. G. Sarwer, O. Chubach, C.-W. Hsu, Y.-W. Huang, S.-M. Lei (MediaTek)]

[JVET-N0095](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5815) CE8-related: Unified method for coding BVD and MVD [S.-T. Hsiang, S.-M. Lei (MediaTek)]

[JVET-N0096](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5816) CE8-related: A fixed updating order for IBC reference memory [C.-Y. Lai, T.-D. Chuang, C.-Y. Chen, C.-W. Hsu, Y.-W. Huang, S.-M. Lei (MediaTek)]

[JVET-N0173](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5893) Non-CE8: IBC Reference Area Rearrange [H. Gao, S. Esenlik, B. Wang, A. M. Kotra, J. Chen (Huawei)]

[JVET-N0611](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6352) Cross-check of JVET-N0173 [?? (??)] [miss] [late]

[JVET-N0174](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5894) Non-CE8: Exclusive Regular Merge and IBC Merge in One Shared Merge List Area [H. Gao, S. Esenlik, B. Wang, A. M. Kotra, J. Chen (Huawei)]

[JVET-N0175](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5895) Non-CE8: IBC Reference Memory for Arbitrary CTU Size [H. Gao, S. Esenlik, B. Wang, A. M. Kotra, J. Chen (Huawei)]

[JVET-N0540](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6268) Crosscheck of JVET-N0175: Non-CE8: IBC Reference Memory for Arbitrary CTU Size [X. Xu (Tencent)] [miss] [late]

[JVET-N0176](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5896) Non-CE8: IBC Merge List Simplification [H. Gao, S. Esenlik, B. Wang, A. M. Kotra, J. Chen (Huawei)]

[JVET-N0201](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5921) Non-CE8: IBC modifications [J. Li, C.-W. Kuo, C. S.Lim (Panasonic)]

[JVET-N0516](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6242) Crosscheck of JVET-N0201 (Non-CE8: IBC modifications) [S.-T. Hsiang (MediaTek)] [miss] [late]

[JVET-N0202](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5922) AHG16/non-CE8: Report on conformance check failures of IBC block vectors [J. Li, C.-W. Kuo, C. S.Lim (Panasonic)] late]

[JVET-N0249](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5969) Non-CE8: An alternative search area for IBC [J. Xu, L. Zhang, K. Zhang, H. Liu, Y. Wang (Bytedance)]

[JVET-N0250](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5971) Non-CE8: Reference memory reduction for intra block copy [J. Xu, L. Zhang, K. Zhang, H. Liu, Y. Wang (Bytedance)]

[JVET-N0251](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5972) Non-CE8: Intra block copy clean-up [J. Xu, L. Zhang, K. Zhang, H. Liu, Y. Wang (Bytedance)]

[JVET-N0541](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6269) Crosscheck of JVET-N0251: Non-CE8: Intra block copy clean-up [X. Xu (Tencent)] [miss] [late]

[JVET-N0258](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5979) CE8-related: Palette Mode Coding [W. Zhu, L. Zhang, J. Xu, K. Zhang, H. Liu, Y. Wang (Bytedance)]

[JVET-N0259](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5980) CE8-related: compound palette mode [W. Zhu, J. Xu, L. Zhang, K. Zhang, H. Liu, Y. Wang (Bytedance)]

[JVET-N0260](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5981) Non-CE8: Disabling fractional MVD search in DMVR for SCC [W. Zhu, H. Liu, K. Zhang, L. Zhang, J. Xu, Y. Wang (Bytedance)]

[JVET-N0289](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6010) CE8-Related: On MVD Coding [M. Salehifar, S. Paluri, S. Kim (LGE)]

[JVET-N0316](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6037) CE8-related: Default Processing for IBC Mode [Y. Han, W.-J. Chien, M. Karczewicz (Qualcomm)]

[JVET-N0558](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6289) Crosscheck of JVET-N0316 (CE8-related: Default Processing for IBC Mode) [T. Zhou (Sharp)] [miss] [late]

[JVET-N0317](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6038) CE8-related: Simplification on IBC Merge/Skip Mode [Y. Han, W.-J. Chien, M. Karczewicz (Qualcomm)]

[JVET-N0593](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6327) Cross-check of JVET-N0317 (CE8-related: Simplification on IBC Merge/Skip Mode) [F. Le Léannec, A. Robert (Technicolor)] [miss] [late]

[JVET-N0318](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6039) CE8-related: Block Size Limitation for IBC Mode [Y. Han, W.-J. Chien, M. Karczewicz (Qualcomm)]

[JVET-N0329](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6050) CE8-related: Encoder improvements on IBC search [X. Xiu, Y.-W. Chen, T.-C. Ma, X. Wang (Kwai Inc.)]

[JVET-N0543](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6271) Crosscheck of JVET-N0329: CE8-related: Encoder improvements on IBC search [X. Xu (Tencent)] [miss] [late]

[JVET-N0337](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6058) CE8-related: Adaptive disabling of intra sample interpolation for screen content coding [X. Xiu, Y.-W. Chen, T.-C. Ma, X. Wang (Kwai Inc.)]

[JVET-N0346](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6067) Non-CE8: Palette Mode in HEVC for YUV4:4:4 format [Y.-H. Chao, H. Wang, W.-J. Chien, V. Seregin, M. Karczewicz (Qualcomm)]

[JVET-N0357](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6078) CE8-related: Context Modelling of Sign for TS Residual Coding [B. Bross, T. Nguyen, H. Schwarz, D. Marpe, T. Wiegand (HHI)]

[JVET-N0366](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6087) CE8-related: Modified limitation on context coded bins for CE8-3.1a and CE8-5.1a [X. Zhao, X. Li, X. Xu, S. Liu (Tencent)] [placeholder] [late]

[JVET-N0382](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6104) CE8-related: unified IBC block vector prediction [X. Xu, X. Li, S. Liu (Tencent)]

[JVET-N0520](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6246) Crosscheck of JVET-N0382 (CE8-related: unified IBC block vector prediction) [C.-C. Chen (MediaTek)] [miss] [late]

[JVET-N0383](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6105) Non-CE8: IBC search range adjustment for implementation consideration [X. Xu, X. Li, S. Liu (Tencent)]

[JVET-N0610](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6351) Cross-check of JVET-N0383 [?? (??)] [miss] [late]

[JVET-N0384](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6106) Non-CE8: IBC search range increase for small CTU sizes [X. Xu, X. Li, S. Liu (Tencent)]

[JVET-N0405](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6127) CE8-related: Palette Mode Simplification [Y.-C. Sun, T.-S. Chang, J. Lou (Alibaba), Y.-H. Chao, V. Seregin, M. Karczewicz (Qualcomm)]

[JVET-N0608](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6349) Crosscheck of JVET-N0405 (CE8-related: Palette Mode Simplification) [W. Zhu (Bytedance)] [miss] [late]

[JVET-N0413](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6135) CE8-related: Quantized residual BDPCM [M. Karczewicz, M. Coban (Qualcomm)]

[JVET-N0430](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6152) CE8-related: Transform skip restriction [J. Choi, J. Heo, S. Yoo, J. Choi, J. Lim, S. Kim (LGE)]

[JVET-N0455](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6177) CE8-related: Sign context modelling and level mapping for TS residual coding [M. Karczewicz, M. Coban (Qualcomm)]

[JVET-N0594](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6328) Cross-chreck of JVET-N0455 (CE8-related: Sign context modelling and level mapping for TS residual coding) [F. Le Léannec, T. Poirier (Technicolor)] [miss] [late]

[JVET-N0609](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6350) Crosscheck of JVET-N0455: CE8-related: Sign context modelling and level mapping for TS residual coding [T. Nguyen (HHI)] [miss] [late]

[JVET-N0459](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6181) CE8-related: Modified block vector coding for IBC [J. Nam, H. Jang, J. Choi, J. Heo, J. Lim, S. Kim (LGE)]

[JVET-N0460](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6182) CE8-related: Default candidates for IBC merge mode [J. Nam, H. Jang, J. Lim, S. Kim (LGE)]

[JVET-N0461](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6183) CE8-related: Signaling on maximum number of candidates for IBC merge mode [J. Nam, H. Jang, J. Lim, S. Kim (LGE)]

[JVET-N0464](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6186) Non-CE8: MMVD Motion vector rounding for SCC [H. Jang, J. Nam, N. Park, J. Lim, S. Kim (LGE)]

[JVET-N0576](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6310) Crosscheck of JVET-N0464: Non-CE8: MMVD Motion vector rounding for SCC [X. Xu (Tencent)] [miss] [late]

[JVET-N0466](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6188) Non-CE8: The corner case handling regarding mv derivation for Chroma IBC in dual tree structure [H. Jang, J. Nam, N. Park, J. Lim, S. Kim (LGE)]

[JVET-N0603](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6344) Crosscheck of JVET-N0466 (Non-CE8: The corner case handling regarding mv derivation for Chroma IBC in dual tree structure) [Y. Han, W.-J. Chien (Qualcomm)] [miss] [late]

[JVET-N0467](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6189) Non-CE8: Experimental result for various size of IBC block with optimized syntax signaling [H. Jang, J. Nam, N. Park, J. Lim, S. Kim (LGE)]

[JVET-N0604](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6345) Crosscheck of JVET-N0467 (Non-CE8 : Experimental result for various size of IBC block with optimized syntax signaling) [Y. Han, W.-J. Chien (Qualcomm)] [miss] [late]

[JVET-N0472](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6194) Non-CE8: On IBC reference buffer design [J. Xu, L. Zhang, K. Zhang, H. Liu, Y. Wang (Bytedance)]

[JVET-N0550](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6279) CE8-related: Subblock based Palette Mode [Y.-H. Chao, T. Hsieh, M. Karczewicz (Qualcomm)] [late]

[JVET-N0580](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6314) Cross-check of JVET-N0550: CE8-related: Line-based CG Palette Mode [X. Xiu (Kwai Inc.)] [miss] [late]

## CE9 related – Decoder motion vector derivation (33)

Contributions in this category were discussed XXday XX March XXXX–XXXX (chaired by XXXqq).

[JVET-N0097](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5817) CE9-related: Simplification of cascading DMVR and BDOF processes [C.-Y. Chen, T.-D. Chuang, C.-C. Chen, C.-Y. Lai, Z.-Y. Lin, C.-W. Hsu, Y.-W. Huang, S.-M. Lei (MediaTek)]

[JVET-N0571](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6305) Crosscheck of JVET-N0097 (CE9-related: Simplification of cascading DMVR and BDOF processes) [Y.-W. Chen (Kwai Inc.)] [miss] [late]

[JVET-N0145](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5865) Non-CE9: Harmonization of DMVR and MMVD [E. Sasaki, T. Hashimoto, T. Chujoh, T. Ikai (Sharp)]

[JVET-N0146](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5866) Non-CE9: On conditions for DMVR and BDOF [T. Chujoh, T. Ikai (Sharp)]

[JVET-N0522](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6248) Crosscheck of JVET-N0146 [P. Bordes (Technicolor)] [miss] [late]

[JVET-N0147](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5867) CE9-related: Simplification of BDOF [T. Chujoh, T. Ikai (Sharp)]

[JVET-N0148](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5868) CE9-related: Early termination for BDOF [T. Chujoh, T. Ikai (Sharp)]

[JVET-N0549](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6278) Crosscheck of JVET-N0148 (CE9-related: Early termination for BDOF) [K. Kondo, M. Ikeda (Sony)] [late]

[JVET-N0152](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5872) Non-CE9: On motion refinement parameter derivation in BDOF [R. Yu, D. Liu (Ericsson)]

[JVET-N0153](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5873) Non-CE9: On DMVR and GBI [R. Yu, D. Liu (Ericsson)]

[JVET-N0566](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6299) Crosscheck of JVET-N0153 (non-CE9: on DMVR and GBI) [H. Lee, S. -C. Lim, J. Lee, J. Kang (ETRI)] [miss] [late]

[JVET-N0158](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5878) CE9-related: Alternative method of SAD based early termination for BDOF [K. Unno, K. Kawamura, S. Naito (KDDI)]

[JVET-N0551](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6280) Crosscheck of JVET-N0158 (CE9-related: Alternative method of SAD based early termination for BDOF) [T. Chujoh, T. Ikai (Sharp)] [miss] [late]

[JVET-N0162](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5882) CE9-related: Modified enabling condition for DMVR [F. Chen, L. Wang (Hikvision)]

[JVET-N0163](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5883) CE9-related: Simplified refinement process for DMVR [F. Chen, L. Wang (Hikvision)]

[JVET-N0179](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5899) Non-CE9: Reducing bi-linear interpolation buffer requirement for DMVR [S. Esenlik, H. Gao, A. M. Kotra, B. Wang, J. Chen (Huawei)]

[JVET-N0209](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5929) CE9-related: Simplification of BDOF based on CE9-2.5 [Y. Kato, K. Abe, T. Toma (Panasonic)]

[JVET-N0239](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5959) CE9-related: BDOF-BWA unification [F. Galpin, T. Poirier, P. Bordes (Technicolor)]

[JVET-N0262](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5983) CE9-related: Disable DMVR if BPWA is not using default weight [H. Huang, W.-J. Chien, M. Karczewicz (Qualcomm)]

[JVET-N0514](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6240) Crosscheck of JVET-N0262 (CE9-related: Disabling DMVR for non equal weight BPWA) [Y.-L. Hsiao (MediaTek)] [late]

[JVET-N0292](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6013) CE9-related: Reference sample access constraints at VPDU level for DMVR [S. Sethuraman (Ittiam)]

[JVET-N0294](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6015) CE9-related: Adaptive search pattern for DMVR [S. Sethuraman (Ittiam)]

[JVET-N0295](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6016) CE9-related: Using extended samples during DMVR SAD cost evaluations [S. Sethuraman (Ittiam)]

[JVET-N0568](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6301) Crosscheck of JVET-N0295 (CE9-related: Using extended samples during DMVR SAD cost evaluations) [H. Lee, S. -C. Lim, J. Lee, J. Kang (ETRI)] [miss] [late]

[JVET-N0296](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6017) CE9-related: DMVR costs based early termination for BDOF in CE9-2.6 [S. Sethuraman (Ittiam)]

[JVET-N0312](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6033) CE9-related: A SIMD-friendly simplification for BDOF [S. Sethuraman (Ittiam)]

[JVET-N0314](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6035) CE9-related: Results for use of DMVR refined MVs from top and top-left CTUs for spatial MV prediction and CU boundary de-blocking [S. Sethuraman (Ittiam)]

[JVET-N0325](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6046) CE9-related: Improvements on bi-directional optical flow (BDOF) [X. Xiu, Y.-W. Chen, T.-C. Ma, X. Wang (Kwai Inc.)]

[JVET-N0328](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6049) Non-CE9: Mutually exclusive DMVR/BDOF at CU level [Y.-W. Chen, X. Xiu, T.-C. Ma, X. Wang (Kwai Inc.)]

[JVET-N0544](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6273) Crosscheck of JVET-N0328 (Non-CE9: Mutually exclusive DMVR/BDOF at CU level) [C.-Y. Chen (MediaTek)] [miss] [late]

[JVET-N0374](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6096) Non-CE9: On early termination for DMVR [H. Lee, S.-C. Lim, J. Lee, J. Kang, H. Y. Kim (ETRI)]

[JVET-N0408](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6130) Non-CE9: Early Termination Techniques for DMVR [C.-C. Chen, W.-J. Chien, M. Karczewicz (Qualcomm)]

[JVET-N0409](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6131) CE9-related: Horizontal and Vertical Boundary Padding Process of DMVR [C.-C. Chen, W.-J. Chien, M. Karczewicz (Qualcomm)]

[JVET-N0440](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6162) CE9-related: Disabling DMVR and BDOF when underlying assumptions are false [H. Liu, L. Zhang, K. Zhang, J. Xu, W. Zhu, Y. Wang (Bytedance)]

[JVET-N0442](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6164) Non-CE9: Conditions fix for DMVR and BDOF [N. Park, H. Jang, J. Nam, J. Lim, S. Kim (LGE)]

[JVET-N0553](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6282) Crosscheck of JVET-N0442 (Non-CE9: Conditions fix for DMVR and BDOF) [T. Chujoh, T. Ikai (Sharp)] [miss] [late]

[JVET-N0443](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6165) Non-CE9: BDOF processing considering assumption for the optical flow [N. Park, H. Jang, J. Nam, J. Lim, S. Kim (LGE)]

[JVET-N0561](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6292) Crosscheck of JVET-N0443 (Non-CE9: BDOF processing considering assumption for the optical flow) [E. Sasaki (Sharp)] [miss] [late]

[JVET-N0589](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6323) Crosscheck of JVET-N0443 (Non-CE9: BDOF processing considering assumption for the optical flow) [?? (??)] [miss] [late]

[JVET-N0444](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6166) Non-CE9: Mismatch beween test specification and reference software on BDOF and DMVR [N. Park, H. Jang, J. Nam, J. Lim, S. Kim (LGE)]

[JVET-N0484](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6206) Non-CE9: Simplification of DMVR and BDOF combination [R.-L. Liao, Y. Ye, J. Chen (Alibaba)]

[JVET-N0574](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6308) Crosscheck of JVET-N0484 (Non-CE9: Simplification of DMVR and BDOF combination) [Y.-W. Chen (Kwai Inc.)] [miss] [late]

[JVET-N0505](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6228) Non-CE9: Simplification of parametric motion vector refinement in DMVR [E. Sasaki, T. Zhou, T. Ikai (Sharp)] [late]

[JVET-N0507](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6230) CE9-related: Early termination of BDOF with DMVR cost [K. Kondo, M. Ikeda (Sony)] [late]

[JVET-N0554](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6283) Crosscheck of JVET-N0507 (CE9-related: Early termination of BDOF with DMVR cost) [T. Chujoh, T. Ikai (Sharp)] [miss] [late]

[JVET-N0548](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6277) CE9-related: Additional experimental results of JVET-N0187 (CE9-2.2) [K. Kondo, M. Ikeda (Sony)] [late]

## CE10 related – Combined intra/inter prediction (3)

Contributions in this category were discussed XXday XX March XXXX–XXXX (chaired by XXXqq).

[JVET-N0327](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6048) CE10-related: Simplification on combined inter and intra prediction (CIIP) [X. Xiu, Y.-W. Chen, T.-C. Ma, X. Wang (Kwai Inc.)]

[JVET-N0537](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6265) Crosscheck of JVET-N0327 (CE10-related: Simplification on combined inter and intra prediction (CIIP)) [L. Zhao (Tencent)] [miss] [late]

[JVET-N0395](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6117) CE10-related: Simplification and Improvement of combined intra-inter prediction mode [L. Zhao, X. Li, X. Zhao, S. Liu (Tencent)]

[JVET-N0579](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6313) Cross-check of JVET-N0395: CE10-related: Simplification and Improvement of combined intra-inter prediction mode [X. Xiu (Kwai Inc.)] [miss] [late]

[JVET-N0508](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6233) CE10-related: A combination of JVET-N0302 (CE10.1.1) and JVET-N0327 [L. Pham Van, G. Van der Auwera, A. K. Ramasubramonian, V. Seregin, M. Karczewicz (Qualcomm), X. Xiu, Y.-W. Chen, T.-C. Ma, X. Wang (Kwai Inc.)] [miss] [late]

## CE11 related – Deblocking (3)

Contributions in this category were discussed XXday XX March XXXX–XXXX (chaired by XXXqq).

[JVET-N0182](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5902) CE11-related: Simplification of sub-pu deblocking and longer tap filter [A. M. Kotra, S. Esenlik, J. Chen, B. Wang, H. Gao (Huawei)]

[JVET-N0619](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6361) Crosscheck of JVET-N0182 (CE11-related: Simplification of sub-pu deblocking and longer tap filter) [C.-M. Tsai (MediaTek)] [miss] [late]

[JVET-N0359](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6080) CE11-related: On MV threshold for deblocking [K. Andersson, J. Enhorn (Ericsson)]

[JVET-N0473](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6195) Non-CE11: On ISP transform boundary deblocking [K. Misra, A. Segall (Sharp Labs of America), M. Ikeda, T. Suzuki (Sony)]

## CE12 related – Tile set boundary motion compensation handling (3)

Contributions in this category were discussed XXday XX March XXXX–XXXX (chaired by XXXqq).

[JVET-N0355](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6076) CE12-related: Normative temporally independent tile group coding [R. Skupin, Y. Sanchez, V. George, K. Sühring, T. Schierl (HHI)]

[JVET-N0402](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6124) CE12-related: MCTS improvement by modifying motion compensation filter coefficients [A. Aminlou, A. Zare, M. M. Hannuksela (Nokia)]

[JVET-N0403](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6125) CE12-related: MCTS improvement by modifying prediction block [A. Aminlou, A. Zare, M. M. Hannuksela (Nokia)]

## CE13 related – Neural-network based loop filtering (1)

Contributions in this category were discussed XXday XX March XXXX–XXXX (chaired by XXXqq).

[JVET-N0133](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5853) CE13-related: In-loop filter with only CNN-based filter [S. Wan, M.-Z.Wang, H. Gong, C.-Y. Zou (NPU), Y.-Z. Ma, J.-Y. Huo (Xidian Univ.), Y.-F. Yu, Y. Liu (OPPO)]

## Quantization (3)

Contributions in this category were discussed XXday XX March XXXX–XXXX (chaired by XXXqq).

[JVET-N0204](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5924) AHG18: Support of quantization matrices [T. Toma, K. Abe (Panasonic), S.-C. Lim, J. Kang (ETRI)]

[JVET-N0221](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5941) Chroma Quantization Parameter Qpc Table for HDR Signal [T. Lu, F. Pu, P. Yin, S. McCarthy, W. Husak, T. Chen (Dolby)]

[JVET-N0246](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5966) Modified dequantization scaling [K. Sharman, S. Keating (Sony)]

## Entropy coding (8)

Contributions in this category were discussed XXday XX March XXXX–XXXX (chaired by XXXqq).

[JVET-N0112](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5832) Simplification of context modeling for coding CU split decisions [S.-T. Hsiang, S.-M. Lei (MediaTek)]

[JVET-N0523](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6249) Crosscheck of JVET-N0112 [P. Bordes, Y. Chen (Technicolor)] [miss] [late]

[JVET-N0207](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5927) AHG14: CABAC skip mode [K. Abe, T. Toma (Panasonic)]

[JVET-N0301](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6022) Simplification of the initialization process for context variables [H. Kirchhoffer, J. Stegemann, D. Marpe, H. Schwarz, T. Wiegand (HHI)]

[JVET-N0311](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6032) Context Modeling Simplification and Reduction in VVC [Y. Chen, F. Le Léannec, T. Poirier (Technicolor)]

[JVET-N0381](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6103) Native CABAC initialization [F. Bossen (Sharp)]

[JVET-N0425](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6147) Simplification of CABAC initialization process [J. Dong, A. Said, V. Seregin, M. Karczewicz (Qualcomm)]

[JVET-N0600](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6340) Context reduction for inter and split syntax elements [Y. Chen, F. Le Léannec, T. Poirier (Technicolor)] [miss] [late]

## Reshaper (9)

Contributions in this category were discussed XXday XX March XXXX–XXXX (chaired by XXXqq).

[JVET-N0113](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5833) AHG16: Subblock-based chroma residual scaling [Z.-Y. Lin, T.-D. Chuang, C.-Y. Chen, Y.-W. Huang, S.-M. Lei (MediaTek)] [late]

[JVET-N0220](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5940) Simplification of Reshaper Implementation [T. Lu, F. Pu, P. Yin, S. McCarthy, W. Husak, T. Chen (Dolby)]

[JVET-N0526](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6253) Crosscheck of JVET-N0220 (Simplification of Reshaper Implementation) [C. Chevance (Technicolor)] [miss] [late]

[JVET-N0274](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5995) Non-CE: Cleanups on in-loop reshaping [K. Zhang (Bytedance)]

[JVET-N0612](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6353) Crosscheck of JVET-N0274 (Non-CE: Cleanups on in-loop reshaping) [T. Lu (Dolby)] [miss] [late]

[JVET-N0299](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6020) On Luma Dependent Chroma Residual Scaling of In-loop Reshaper [J. Zhao, S. Kim (LGE)]

[JVET-N0300](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6021) On High Bit Depth Signaling of In-loop Reshaper [J. Zhao, S. Kim (LGE)]

[JVET-N0613](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6354) Crosscheck of JVET-N0300 (On High Bit Depth Signaling of In-loop Reshaper) [T. Lu (Dolby)] [miss] [late]

[JVET-N0389](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6111) Chroma residual scaling with separate luma/chroma tree [E. François, C. Chevance (Technicolor)]

[JVET-N0614](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6355) Crosscheck of JVET-N0389 (Chroma residual scaling with separate luma/chroma tree) [T. Lu (Dolby)] [miss] [late]

[JVET-N0417](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6139) Simplified luma dependant chroma residual scaling of in-loop reshaper [N. Hu, V. Seregin, M. Karczewicz (Qualcomm)]

[JVET-N0477](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6199) On luma mapping with chroma scaling [Y. Ye, J. Chen, R. Liao (Alibaba)]

[JVET-N0615](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6356) Crosscheck of JVET-N0477 (On luma mapping with chroma scaling) [[T. Lu](mailto:tlu@dolby.com) (Dolby) [miss] [late]

## Other coding tools (3)

Contributions in this category were discussed XXday XX March XXXX–XXXX (chaired by XXXqq).

[JVET-N0342](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6063) Non-CE: Decoder-side Intra Mode Derivation with Prediction Fusion [M. Abdoli, E. Mora, T. Guionnet, M. Raulet (ATEME)]

[JVET-N0590](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6324) Crosscheck of JVET-N0342 (Decoder-side Intra Mode Derivation with Prediction Fusion) [?? (??)] [miss] [late]

[JVET-N0368](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6089) An implementation of adaptive color transform in VVC [X. Zhao, X. Xu, X. Li, S. Liu (Tencent)]

[JVET-N0421](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6143) Non-CE: Unsymmetrical quadtree partitioning [K. Zhang, L. Zhang, H. Liu, J. Xu, Y. Wang (Bytedance)]

## High-level syntax (78)

Contributions in this category were discussed XXday XX March XXXX–XXXX (chaired by XXXqq).

### Interfacing with MPEG Systems (1)

[JVET-N0041](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5761) Summary of the status of systems-related issues for VVC [Y. Lim (Samsung), E. Thomas (TNO)]

### General high-level syntax (31)

#### NAL unit header and genearl apsects of parameter sets (6)

[JVET-N0050](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5770) AHG17: On Forbidden-Zero Bit in NAL Unit Header [S. Wenger, B. Choi, S. Liu (Tencent)]

[JVET-N0051](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5771) AHG17: On NAL Unit header design for VVC [S. Wenger, B. Choi, S. Liu (Tencent)]

[JVET-N0067](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5787) AHG17: On the first byte of the NAL unit header [M. M. Hannuksela, K. Kammachi-Sreedhar (Nokia)] [late]

[JVET-N0278](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5999) AHG17: On VVC HLS relevant to MPEG requirements on immersive media delivery and access (N18134) [J. Boyce (Intel)] [late]

[JVET-N0511](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6237) AHG17: Signalling leading picture information in the NAL unit header structure [L. Chen, C.-W. Hsu, Y.-W. Huang, S.-M. Lei (MediaTek)] [late]

[JVET-N0349](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6070) AHG17: On Parameter Set Design for VVC [K. Sühring, R. Skupin, Y. Sanchez, T. Schierl (HHI)]

#### Reference picture management (4)

[JVET-N0058](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5778) AHG17: On decoded picture buffer management [B. Choi, S. Wenger, S. Liu (Tencent)] [late]

[JVET-N0100](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5820) AHG17: On Reference Picture List Signalling [S. Deshpande (Sharp)]

[JVET-N0135](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5855) AHG17: On reference picture list [Y. Fujimoto, T. Suzuki (Sony)] [late]

[JVET-N0136](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5856) AHG17: On non-referenced picture [[Y. Fujimoto](mailto:Yuji.Fujimoto@sony.com), T. Suzuki (Sony)] [late]

#### APS and tile group header (8)

[JVET-N0065](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5785) AHG17 & AHG9: Comments on carriage of coding tool parameters in Adaptation Parameter Set [M. Li, P. Wu (ZTE)]

[JVET-N0069](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5789) AHG16/AHG17: Proposed Cleanup for Reshaper High Level Syntax [B. Heng, M. Zhou, W. Wan (Broadcom)]

[JVET-N0117](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5837) AHG17: Signalling of reshaper parameters in APS [Y.-K. Wang, Hendry, J. Chen (Huawei), P. Yin, T. Lu, F. Pu, S. McCarthy (Dolby)]

[JVET-N0138](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5858) AHG17: Carriage of reshaper model parameters [W. Choi, K. Choi, K. Choi (Samsung)]

[JVET-N0284](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6005) AHG17: On ALF and Reshaper Signaling [S.Paluri, J. Zhao, J. Lim, S. Kim (LGE)]

[JVET-N0290](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6011) AHG17: Conditional Signaling of ALF and In-Loop Reshaper Model [S.Paluri, J. Zhao, J. Lim, S. Kim (LGE)]

[JVET-N0293](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6014) AHG17: Reshaper Reset Signaling [S. Paluri, J. Zhao, J. Lim, S. Kim (LGE)]

[JVET-N0297](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6018) AHG17: Reshaper Model Signaling for Intra Coded Tile Group [S. Paluri, J. Zhao, J. Lim, S. Kim (LGE)]

#### Interoperability and capability points definition and signalling (1)

[JVET-N0276](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5997) AHG15: On interoperability point signalling [J. Boyce (Intel)]

#### High efficiency random access (4)

Contributions in this category were discussed XXday XX March XXXX–XXXX (chaired by XXXqq).

[JVET-N0119](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5839) AHG17: EDR - external decoding refresh [Y.-K. Wang (Huawei)] [late]

[JVET-N0244](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5964) AHG17: Video coding based on cross RAP referencing (CRR) [H. Yu, L. Yu (Zhejiang Univ.)] [miss] [late]

[JVET-N0494](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6216) AHG17: Dependent random access point pictures in VVC [M. Pettersson, R. Sjöberg, M. Damghanian (Ericsson)]

[JVET-N0072](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5792) AHG17: New NAL unit types for VVC [L. Chen, C.-W. Hsu, Y.-W. Huang, S.-M. Lei (MediaTek)]

The DRAP part of this document belongs to this agenda item.

#### Miscellaneous general HLS topics (8)

[JVET-N0061](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5781) AHG19: Signalling temporal IDs and levels for HFR backwards compatible bitstreams [V. Drugeon (Panasonic)]

[JVET-N0063](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5783) AHG17: Separate essential display information from non-essential display information in the Video Usability Information [V. Drugeon (Panasonic)]

[JVET-N0120](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5840) AHG17: Misc. HLS clean-ups [Y.-K. Wang (Huawei)] [late]

[JVET-N0227](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5947) Maximum transform size signaling in HLS [L. Li, M. Koo, J. Nam, J. Heo, J. Lim (LGE)] [miss] [late]

[JVET-N0234](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5954) [AHG12/AHG17] Signaling of virtual boundaries [A. DSouza, C. Pujara, R. Gadde, W. Choi, K. Choi, K.P. Choi (Samsung)] [late]

[JVET-N0438](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6160) AHG12: Loop filter disabled across virtual boundaries [S.-Y. Lin, L. Liu, J.-L. Lin, Y.-C. Chang, C.-C. Ju (MediaTek), P. Hanhart, Y. He (InterDigital)]

[JVET-N0288](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6009) AHG17: Comments on High-Level Syntax of VVC [S. Deshpande (Sharp)]

[JVET-N0352](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6073) AHG17: Conformance Window [K. Sühring, R. Skupin, Y. Sanchez, T. Schierl (HHI)]

### Coded picture regions (30)

#### Tiles and tile groups (11)

[JVET-N0056](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5776) AHG12: On tile design [B. Choi, S. Wenger, S. Liu (Tencent)]

[JVET-N0057](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5777) AHG12: On tile group design [B. Choi, S. Wenger, S. Liu (Tencent)]

[JVET-N0064](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5784) AHG17: Signalling of only one tile group per picture [V. Drugeon (Panasonic)]

[JVET-N0066](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5786) AHG12: On top-to-bottom tile partitioning [Y. He, A. Hamza (InterDigital)]

[JVET-N0071](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5791) AHG12: Unified signalling of tile grouping information [L. Chen, C.-Y. Chen, Y.-W. Huang, S.-M. Lei (MediaTek)]

[JVET-N0111](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5831) AHG12: Flexible tiling [Y.-K. Wang, Hendry, M. Sychev (Huawei)]

[JVET-N0124](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5844) AHG12: On Tile Group Signalling [S. Deshpande (Sharp)]

[JVET-N0348](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6069) AHG12: Hierarchical tiling for VVC [R. Skupin, Y. Sanchez, K. Sühring, T. Schierl (HHI)]

[JVET-N0496](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6218) AHG12: Rectangular tile group address signaling [[R. Sjöberg](mailto:rickard.sjoberg@ericsson.com), [M. Damghanian](mailto:mitra.damghanian@ericsson.com), [M. Pettersson (Ericsson)](mailto:martin.m.pettersson@ericsson.com)]

[JVET-N0497](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6219) AHG12: Dependent tiles [R. Sjöberg, M. Pettersson, M. Damghanian (Ericsson)]

[JVET-N0498](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6220) AHG12: On Uniform Tile Partitioning [R. Sjöberg, M. Pettersson, M. Damghanian (Ericsson)]

#### Independently coded picture regions (16)

[JVET-N0042](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5762) AHG12: Comments on MPEG draft requirements on immersive media access and delivery [M. M. Hannuksela, E. B. Aksu, A. Hourunranta (Nokia)]

[JVET-N0043](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5763) AHG12: VVC design goals related to MPEG requirements on immersive media access and delivery [M. M. Hannuksela, E. B. Aksu (Nokia)]

[JVET-N0044](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5764) AHG12: Comparison of approaches for independently coded picture regions [M. M. Hannuksela, A. Aminlou, K. Kammachi-Sreedhar (Nokia)]

[JVET-N0045](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5765) AHG12: Sub-picture layers for realizing independently coded picture regions [M. M. Hannuksela, K. Kammachi-Sreedhar, A. Aminlou (Nokia)]

[JVET-N0046](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5766) AHG12: Sub-picture-based picture partitioning and decoding [M. M. Hannuksela, A. Aminlou (Nokia)]

[JVET-N0055](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5775) AHG12: On sub-picture design [B. Choi, S. Wenger, S. Liu (Tencent)]

[JVET-N0073](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5793) AHG17: [SYS-VVC] Signalling subpicture coded video sequence [L. Chen, C.-Y. Chen, Y.-W. Huang, S.-M. Lei (MediaTek)]

[JVET-N0099](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5819) AHG12/AHG17 On sub-picture parameter set [Y. He, A. Hazma (InterDigital)]

[JVET-N0107](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5827) Sub-picture based video coding [Y.-K. Wang, Hendry, J. Chen (Huawei)]

[JVET-N0191](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5911) [AHG17/AHG12] On APS id for bitstream merging for VVC [N. Ouedraogo, E. Nassor, J. Taquet, G. Kergourlay, F. Maze (Canon)]

[JVET-N0192](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5912) [AHG17/AHG12] Bitstream extraction and merging with variable initial Qp [N. Ouedraogo, E. Nassor, G. Kergourlay, F. Maze (Canon)]

[JVET-N0354](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6075) AHG12: Conformance of temporally independent tile groups [R. Skupin, Y. Sanchez, K. Sühring, T. Schierl (HHI)]

[JVET-N0411](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6133) AHG12: Layout signalling of independent coded regions [E. Thomas (TNO)]

[JVET-N0528](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6255) AHG12/AHG19/SYS-VVC: Sub-picture decoding design: a comparison of proposed solutions [E. Thomas (TNO)] [late]

[JVET-N0047](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5767) AHG12/AHG17: Merging IRAP and non-IRAP VCL NAL units into the same coded picture [M. M. Hannuksela (Nokia)]

[JVET-N0108](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5828) AHG12/AHG17: Allowing mixed IRAP and non-IRAP NAL unit types within a picture [Y.-K. Wang, Hendry (Huawei)]

#### Wavefront parallel processing (3)

[JVET-N0060](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5780) AHG12: Improved parallel processing capability with WPP [Y. Fujimoto, M. Ikeda, T. Suzuki (Sony)]

[JVET-N0559](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6290) Crosscheck of JVET-N0060 (AHG12: Improved parallel processing capability with WPP) [T. Ikai (Sharp)] [late]

[JVET-N0149](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5869) AHG12: Signalling on wavefront parallel processing [T. Ikai, S. Deshpande, T. Chujoh, E. Sasaki, T. Aono (Sharp)] [late]

[JVET-N0150](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5870) AHG12: One CTU delay wavefront parallel processing [T. Ikai (Sharp)]

### Low latency random access (10)

[JVET-N0072](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5792) AHG17: New NAL unit types for VVC [L. Chen, C.-W. Hsu, Y.-W. Huang, S.-M. Lei (MediaTek)]

The GDR part of this document belongs to this agenda item.

[JVET-N0080](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5800) AHG14: Revised software for ultra low-latency encoding [K. Kazui (Fujitsu)]

[JVET-N0101](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5821) AHG14/ AHG17: On Gradual and Clean Random Access [S. Deshpande (Sharp)]

[JVET-N0114](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5834) AHG14: A delay analysis for IRAP and GDR [Hendry, Y.-K. Wang, M. Sychev (Huawei)]

[JVET-N0115](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5835) AHG14/AHG17: GDR - gradual decoding refresh [Hendry, Y.-K. Wang, J. Chen, S. Hong (Huawei)]

[JVET-N0116](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5836) AHG14/AHG17: DDR - distributed decoding refresh [Y.-K. Wang, M. Sychev, Hendry (Huawei)]

[JVET-N0275](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5996) AHG14/AHG8/AHG17: Sections for intra refresh and inloop filter disabling [J. Boyce, R. Lei, L. Xu (Intel)]

[JVET-N0310](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6031) AHG14: On gradual decoding refresh [M. M. Hannuksela, K. Kammachi-Sreedhar, A. Aminlou (Nokia)] [late]

[JVET-N0391](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6113) AHG14: Software updates for intra refresh [J.-M. Thiesse, D. Gommelet, D. Nicholson (VITEC)] [late]

[JVET-N0495](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6217) AHG14: Recovery point indication NAL unit [R. Sjöberg, M. Pettersson, M. Damghanian (Ericsson)]

### HRD (6)

[JVET-N0062](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5782) AHG19: Signalling HRD models for HFR backwards compatible bitstreams [V. Drugeon (Panasonic)]

[JVET-N0077](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5797) Hypothetical Reference Decoder in VVC [K. Kazui (Fujitsu)]

[JVET-N0350](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6071) AHG17: HRD starting point [R. Skupin, Y. Sanchez, K. Sühring, T. Schierl (HHI)]

[JVET-N0351](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6072) AHG17: HRD parameters for temporal scalability [R. Skupin, Y. Sanchez, K. Sühring, T. Schierl (HHI)]

[JVET-N0353](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6074) AHG17: Parsing of HRD related SEI messages [K. Sühring, R. Skupin, Y. Sanchez, T. Schierl (HHI)]

[JVET-N0423](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6145) AHG17: Hypothetical Reference Decoder [S. Deshpande (Sharp)]

# Complexity analysis and reduction (2)

Contributions in this category were discussed XXday XX March XXXX–XXXX (chaired by XXXqq).

[JVET-N0049](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5769) AHG16: A study of bin to bit ratio in VTM4.0 and HM16.19 [M. Zhou (Broadcom)]

[JVET-N0397](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6119) AHG16: Memory bandwidth reduction for small CUs [X. Li, G. Li, X. Xu, S. Liu (Tencent)]

[JVET-N0564](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=6296) Crosscheck of JVET-N0397 (AHG16: Memory bandwidth reduction for small CUs) [Y. He (InterDigital)] [miss] [late]

# Encoder optimization (2)

Contributions in this category were discussed XXday XX March XXXX–XXXX (chaired by XXXqq).

[JVET-N0238](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5958) AHG13: ISP Tool-off Tests in VTM-4.0.1 [S. De-Luxán-Hernández, B. Bross, H. Schwarz, D. Marpe, T. Wiegand (HHI)]

[JVET-N0247](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=5967) Non-CE: An improvement to hash-based motion estimation [J. Li, J. Xu, L. Zhang, K. Zhang, H. Liu, Y. Wang (Bytedance)]

# Metrics and evaluation criteria (X)

Contributions in this category were discussed XXday XX March XXXX–XXXX (chaired by XXXqq).

# Withdrawn (6)

JVET-N0156 Withdrawn

JVET-N0231 Withdrawn

JVET-N0245 Withdrawn

JVET-N0315 Withdrawn

JVET-N0431 Withdrawn

JVET-N0501 Withdrawn

# Plenary meetings, joint meetings, BoG reports, and summary of actions taken

## Plenary meeting XXday XX March XXXX-

Reports of the tracks were presented as follows:

Track A:

Track B:

## Joint meeting XXday XX March XXXX-

JVET with … .

## Closing plenary sessions

## BoGs (X)

## List of actions taken affecting Draft 3 of VVC, VTM 3, and 360Lib

The following is a summary, in the form of a brief list, of the actions taken at the meeting that affect the text of the VVC draft text, VTM or 360Lib description. Both technical and editorial issues are included. This list is provided only as a summary – details of specific actions are noted elsewhere in this report and the list provided here may not be complete and correct. The listing of a document number only indicates that the document is related, not that it was adopted in whole or in part.

# Project planning

## Core experiment planning

…

## 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 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:

* No review of normative contributions without draft specification text
* VTM algorithm description text is strongly encouraged for non-normative contributions
* Early upload deadline to enable substantial study prior to the meeting
* Using a clock timer to ensure efficient proposal presentations (5 min) and discussions

The document upload deadline for the next meeting was planned to be XXday XX June 2019.

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 during the opening plenary on January 9 that those rules which had been set up or refined during the 12th meeting should be observed. In particular, for some CEs, results were available late, and some changes in the experimental setup (particularly in CE4) were not 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 the draft standard by the next meeting.
* 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 tha 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; the method for members to obtain the credentials is TBA on the reflector).
* During the experiment, revisions of the experiment plans can be made, but not substantial changes to the proposed technology.
* 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 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 are described in the output document JVET-M1010.

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”, 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.

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 is 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.
* All substantial communications about a CE, other than logistics arrangements, exchange of data, minor refinement of the test plans, and preparation of documents shall be conducted on the main JVET reflector. In the case that large amounts of data are to be distributed is recommended to send an announcement to the JVET reflector without attaching the materials, and send the materials to those who have requested it directly, or provide a link to it, 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.

T2 = Test model software release + 2 weeks or X XX, whichever is earlier: 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 and announced on the JVET reflector. The name of the cross-checkers and list of specific tests for each tool under study in the CE plan description by this time. Full test results must be provided at this time (at least for proposals targeting to be promoted to the draft standard at the next meeting).

CE reports may contain additional information about tests of straightforwared 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). [Search/remove obsolete references to BMS.]

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, we would like see comprehensive cross-checking done, with analysis that the description matches the software, and recommendation of value of the tool 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.

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

Plans for the CEs to be conducted were established Thursday 18 January (GJS); CE plan documents were reviewed Friday 19 January (GJS & JRO).

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.

## Software development and anchor generation (update)

The planned timeline for software releases was established as follows:

* VTM4.0 will be released by 2019-02-11. VTM4.1 with non-CTC adoptions will be released later. (If necessary, VTM4.0 may not include final tuning of context initialization values.)
* Further versions of VTM may be released for additional bug fixing, as appropriate.
* Preparation of the VTM software will include immediate removal of macros that were added in the previous meeting cycle. The software coordinator has the discretion to retain some such macros.
* Timeline of 360lib9.0: 1 week after the release of VTM4.0 (2019-02-18). Further versions may be released as appropriate for bug fixing.

# 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](mailto:jvet@lists.rwth-aachen.de)).

|  |  |  |
| --- | --- | --- |
| **Title and Email Reflector** | **Chairs** | **Mtg** |
| **Project Management (AHG1)**  ([jvet@lists.rwth-aachen.de](mailto:jvet@lists.rwth-aachen.de))   * Coordinate overall JVET interim efforts. * Supervise CE and AHG studies. * Report on project status to JVET reflector. * Provide a report to next meeting on project coordination status. | J.-R. Ohm, G. J. Sullivan (co-chairs) | N |
| **Draft text and test model algorithm description editing (AHG2)**  ([jvet@lists.rwth-aachen.de](mailto:jvet@lists.rwth-aachen.de))   * Produce and finalize JVET-M1001 VVC text specification draft 4. * Produce and finalize JVET-M1002 VVC Test Model 4 (VTM 4) Algorithm and Encoder Description. * Gather and address comments for refinement of these documents. * Coordinate with test model software development AhG to address issues relating to mismatches between software and text. | B. Bross, J. Chen (co-chairs), J. Boyce, S. Kim, S. Liu, Y. Ye (vice-chairs) | N |
| **Test model software development (AHG3)**  ([jvet@lists.rwth-aachen.de](mailto:jvet@lists.rwth-aachen.de))   * Coordinate development of test model (VTM) software and associated configuration files. * Produce documentation of software usage for distribution with the software. * Discuss and make recommendations on the software development process. * Propose improvements to the guideline document for developments of the test model software. * Perform tests of VTM 4 behaviour relative to HEVC and VTM 3 using the VTM common test conditions and the multi-resolution streaming test conditions described in JVET-M0466. * 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. * Coordinate with AHG6 for integration with 360lib software. | F. Bossen, X. Li, A. Norkin, K. Sühring (co-chairs) | N |
| **Test material and visual assessment (AHG4)**  ([jvet@lists.rwth-aachen.de](mailto:jvet@lists.rwth-aachen.de))   * Maintain the video sequence test material database for development of the VVC standard. * Identify and recommend appropriate test materials for use in the development of the VVC standard. * Identify missing types of video material, solicit contributions, collect, and make available a variety of video sequence test material. * Evaluate new test sequences, particularly including the material recently submitted by the Blender Foundation / Blender Animation Studio and Twitch. * Propose a new structure for the test sequence repository. * Facilitate availability of viewing equipment and facilities arrangements for the next meeting and pre-meeting testing as feasible. | T. Suzuki (chair), V. Baroncini, R. Chernyak, P. Hanhart, A. Norkin, J. Ye (vice-chairs) | N |
| **Memory bandwidth consumption of coding tools (AHG5)**  ([jvet@lists.rwth-aachen.de](mailto:jvet@lists.rwth-aachen.de))   * Develop improved software tools for measuring both average and worst case of memory bandwidth, and provide information for usage of these tools. * Study cache configurations for measuring decoder memory bandwidth consumption. * Identify coding tools in CEs and VTM with significant memory bandwidth impact. * Study the impact of memory bandwidth on specific application cases. | R. Hashimoto (chair), T. Ikai, X. Li, D. Luo, H. Yang, M. Zhou (vice-chairs) | N |
| **360° video conversion software development (AHG6)**  ([jvet@lists.rwth-aachen.de](mailto:jvet@lists.rwth-aachen.de))   * Prepare and deliver the 360Lib-9.0 software version and common test condition configuration files according to JVET-M1012. * Generate CTC (PHEC) anchors and PERP results for VTM according to JVET-M1012, and finalize the reporting template for the common test conditions. * Produce documentation of software usage for distribution with the software. | Y. He, K. Choi (co-chairs) | N |
| **Coding of HDR/WCG material (AHG7)**  ([jvet@lists.rwth-aachen.de](mailto:jvet@lists.rwth-aachen.de))   * Study and evaluate available HDR/WCG test content. * Study objective metrics for quality assessment of HDR/WCG material, including investigation of the correlation between subjective and objective results of the CfP responses. * Compare the performance of the VTM and HM for HDR/WCG content. * Prepare for expert viewing of HDR content at the 14th JVET meeting if feasible. * Coordinate implementation of HDR anchor aspects in the test model software with AHG3. * Study additional aspects of coding HDR/WCG content. | A. Segall (chair), E. François, W. Husak, D. Rusanovskyy (vice-chairs) | N |
| **360° video coding tools and test conditions (AHG8)**  ([jvet@lists.rwth-aachen.de](mailto:jvet@lists.rwth-aachen.de))   * Study the effect on compression and subjective quality of different projections formats, resolutions, and packing layouts. * Discuss refinements of common test conditions, test sequences, and evaluation criteria. * Solicit additional test sequences, and evaluate suitability of test sequences on head-mounted displays and normal 2D displays. * Study coding tools dedicated to 360° video, their impact on compression, and implications to the core codec design. * Study the effect of viewport resolution, field of view, and viewport speed/direction on visual comfort. * Study complexity of GPU rendering of projection formats * Study syntax for signalling of projection formats, cubeface layouts, spherical rotations | J. Boyce (chair), K. Choi, P. Hanhart, J.-L. Lin (vice-chairs) | N |
| **Neural networks in video coding (AHG9)**  ([jvet@lists.rwth-aachen.de](mailto:jvet@lists.rwth-aachen.de))   * Investigate the benefit of using neural networks in video compression such as CNN loop filter, intra prediction, re-sampling in adaptive resolution coding, and encoder side partition mode decisions. * Investigate the complexity impact of using neural networks in video compression. * Investigate the complexity measurement of neural network coding tools. * Investigate the impact of training materials on the performance of neural network coding tools. * Investigate the impact of the training process on performance and complexity. | S. Liu (chair), B. Choi, K. Kawamura, Y. Li, L. Wang, P. Wu, H. Yang (vice-chairs) | N |
| **Encoding algorithm optimization (AHG10)**  ([jvet@lists.rwth-aachen.de](mailto:jvet@lists.rwth-aachen.de))   * Study the impact of using techniques such as GOP structures and perceptually optimized adaptive quantization for encoder optimization. * Study the impact of adaptive quantization on individual tools in the test model. * Study the quantization adaptation tool in the test model. * Investigate the feasibility of adding a CTC test category in which adaptive quantization is turned on. * Study quality metrics for measuring subjective quality using e.g. the CfP response MOS scores. * Investigate other methods of improving objective and/or subjective quality, including adaptive coding structures, adaptive quantization without signalling, and multi-pass encoding. * Study methods of rate control and their impact on performance, subjective and objective quality. | A. Duenas, A. Tourapis (co-chairs), C. Helmrich, S. Ikonin, A. Norkin, R. Sjöberg, T. Toma (vice-chairs) | N |
| **Screen content coding (AHG11)**  ([jvet@lists.rwth-aachen.de](mailto:jvet@lists.rwth-aachen.de))   * Investigate coding tools targeted at screen content in terms of compression benefit and implementation complexity. * Identify test materials, discuss testing conditions for screen content coding, and propose associated updated common test conditions. * Study the impact of loop filters on screen content coding | S. Liu (chair), J. Boyce, A. Filippov, Y.-C. Sun, J. Xu, M. Zhou (vice-chairs) | N |
| **High-level parallelism and coded picture regions (AHG12)**  ([jvet@lists.rwth-aachen.de](mailto:jvet@lists.rwth-aachen.de))   * Study wavefront processing including the relationship with tiles and low delay characteristics. * Study flexible loop filter control and tile size restriction, including identifying implications on coding tools and implementation. * Study flexible tile partitioning (e.g. more flexible than HEVC and tile boundaries not spanning a full picture). * Study support of independently coded picture regions, including easy rewriting of such regions into a conforming sub-bitstream. * Prepare software and configurations for the test model to facilitate parallel processing tests. * Study the coding efficiency impact of parallel processing and coded picture regions. | S. Deshpande (chair), M. M. Hannuksela, R. Sjöberg, R. Skupin, W. Wan, Y.-K. Wang S. Wenger (vice-chairs) | N |
| **Tool reporting procedure (AHG13)**  ([jvet@lists.rwth-aachen.de](mailto:jvet@lists.rwth-aachen.de))   * Prepare output document JVET-M1005, which describes the methodology of tool-off testing and a list of tools to be tested by identified testers. * Provide configurations files, bitstreams, and results of tool-on/tool-off testing. * Use the tool usage counts and memory bandwidth usage to study the decoder complexity of features in on/off testing. * Prepare a report with results of the tests. | W.-J. Chien, J. Boyce (co-chairs), Y.-W. Chen, R. Chernyak, K. Choi, R. Hashimoto, Y.**-**W. Huang, H. Jang, S. Liu, D. Luo (vice-chairs) | N |
| **Progressive intra refresh (AHG14)**  ([jvet@lists.rwth-aachen.de](mailto:jvet@lists.rwth-aachen.de))   * Define relevant test conditions for the study of progressive intra refresh for random access without intra frames * Update the implementation of encoder-only intra refresh in the VTM model in the AHG14 fork of the software repository. * Evaluate different ways to produce intra refresh within VVC and characterize their coding efficiency impact, subjective quality, and delay characteristics, including encoder-only approaches and normative approaches * Consider the use of constrained intra prediction and tile-based approaches * Study recovery point handling, including practical implementation issues and perfect-versus-approximate decoded picture recovery. * Consider the potential need for starting a coded video sequence without an intra picture. | J.-M. Thiesse (chair), A. Duenas, K. Kazui, R. Sjöberg, A. Tourapis (vice-chairs) | N |
| **Bitstream decoding properties signalling (AHG15)**  ([jvet@lists.rwth-aachen.de](mailto:jvet@lists.rwth-aachen.de))   * Study syntax alternatives for interoperability point signalling * Study selection of constraint flags to be included in the VTM and their impact on syntax, semantics, and decoding process | J. Boyce (chair), J. Chen, S. Deshpande, M. Karczewicz, A. Tourapis, Y.-K. Wang, S. Wenger (vice-chairs) | N |
| **Implementation studies (AHG16)**  ([jvet@lists.rwth-aachen.de](mailto:jvet@lists.rwth-aachen.de))   * Study draft and proposed coding tools to identify implementation issues relating to decoder pipelines, decoder throughput, and other aspects of implementation difficulty. * Solicit hardware analysis of complex tools. * Particularly consider intra reconstruction throughput for small blocks. * Provide feedback on potential solutions to address identified issues. | M. Zhou (chair), J. An, E. Chai, K. Choi, S. Ethuraman, T. Hsieh, X. Xiu (vice-chairs) | N |
| **High-level syntax (AHG17)**  ([jvet@lists.rwth-aachen.de](mailto:jvet@lists.rwth-aachen.de))   * Study NAL unit header, sequence parameter set, picture parameter set, adaptation parameter set, and tile group header syntax designs * Study the proposed picture header designs and alternatives * Study reference picture buffering and list construction * Study random access signalling and random access approaches, including approaches with reference pictures provided by external means * Assist in software development and text drafting for the high-level syntax in the VVC design. | R. Sjöberg (chair), S. Deshpande, M. M. Hannuksela, R. Skupin, Y.-K. Wang, S. Wenger, H. Yu (vice-chairs) | N |
| **Quantization control (AHG18)**  ([jvet@lists.rwth-aachen.de](mailto:jvet@lists.rwth-aachen.de))   * Identify methods for quantization step size control for luma and chroma, including spatially and frequency-adaptive approaches * Develop methods for evaluating quantization step size control operation * Study the impact of MTS transforms on quantization matrices and the need for default matrices * Study the interaction between in-loop “reshaping” and quantization step size control * Develop testing conditions for evaluating QP signalling improvements including rate control and perceptual optimization strategies as appropriate * Evaluate the performance of the current VVC QP design using the two adaptive quantization control techniques currently available in the VTM | R. Chernyak (chair), E. François, C. Helmrich, A. Segall (vice-chairs) | N |
| **Layered coding and resolution adaptivity (AHG19)**  ([jvet@lists.rwth-aachen.de](mailto:jvet@lists.rwth-aachen.de))   * Study adaptive-resolution coding approaches for real-time communication, adaptive streaming, and 360-degree viewport-dependent streaming, including filters for resampling, reference picture management, and related scope and signalling * Study approaches for temporal scalability to avoid temporal judder when temporal scalability sub-bitstream extraction is used for achieving lower frame rate, and consider whether this should have a normative impact. * Identify related test conditions, test sequences, and evaluation techniques (including subjective assessment techniques) * Study potential approaches for support of layered coding scalability including spatial, temporal, quality, and view scalability | S. Wenger and A. Segall (co-chairs), M. M. Hannuksela, Hendry, S. McCarthy, Y.-C. Sun (vice-chairs) | N |

# Output documents

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 MPEG output document, a separate version under the MPEG document header should be generated. This version should be sent to GJS and JRO for upload.

[JVET-M1000](http://phenix.int-evry.fr/jvet/doc_end_user/current_document.php?id=5754) Meeting Report of the 13th JVET Meeting [G. J. Sullivan, J.-R. Ohm] (2019-03-08, near next meeting)

Initial versions of the meeting notes (d0 … d8) were made available on a daily basis during the meeting.

[JVET-M1001](http://phenix.int-evry.fr/jvet/doc_end_user/current_document.php?id=5755) Versatile Video Coding (Draft 4) [B. Bross, J. Chen, S. Liu] [WG 11 [N 18274](http://phenix.it-sudparis.eu/mpeg/doc_end_user/current_document.php?id=66428&id_meeting=177)] (2019-03-08)

(Initial version planned to be made available by 2019-02-01.)

See the list of elements under section **Error! Reference source not found.**, as agreed by the Wed. 18 October plenary.

[JVET-M1002](http://phenix.int-evry.fr/jvet/doc_end_user/current_document.php?id=5756) Algorithm description for Versatile Video Coding and Test Model 4 (VTM 4) [J. Chen, Y. Ye, S. Kim] [WG 11 [N 18725](http://phenix.it-sudparis.eu/mpeg/doc_end_user/current_document.php?id=66429&id_meeting=177)] (2019-03-08)

(Initial version planned to be made available by 2019-02-15.)

See the list of elements under section **Error! Reference source not found.**, as agreed by the Wed. 18 October plenary.

Remains valid – not updated: [JVET-K1003](http://phenix.it-sudparis.eu/jvet/doc_end_user/current_document.php?id=4112) Guidelines for VVC reference software development [K. Sühring] (2018-07-31)

New version?

[JVET-M1004](http://phenix.int-evry.fr/jvet/doc_end_user/current_document.php?id=5757) Algorithm descriptions of projection format conversion and video quality metrics in 360Lib (Version 9) [Y. Ye, J. Boyce] (2019-02-15)

Remains valid – not updated: [JVET-L1005](http://phenix.int-evry.fr/jvet/doc_end_user/current_document.php?id=4837) Methodology and reporting template for coding tool testing [W.-J. Chien and J. Boyce] (2018-10-26)

[JVET-M1006](http://phenix.int-evry.fr/jvet/doc_end_user/current_document.php?id=5758) Methodology and reporting template for neural network coding tool testing [Y. Li, S. Liu, K. Kawamura] (2019-02-01)

This output was produced to capture aspects specific to enable study of neural network techniques.

[JVET-M1010](http://phenix.int-evry.fr/jvet/doc_end_user/current_document.php?id=5759) JVET common test conditions and software reference configurations for SDR video [F. Bossen, J. Boyce, X. Li, V. Seregin, K. Sühring] (2019-02-01)

Update regarding CPR and hash search, used only for class F.

Enable inter MTS for lower-resoluitons? Perhaps in a CE, but not in CTC.

Remains valid – not updated: [JVET-L1011](http://phenix.int-evry.fr/jvet/doc_end_user/current_document.php?id=4832) JVET common test conditions and evaluation procedures for HDR/WCG video [A. Segall, E. François, S. Iwamura, D. Rusanovskyy] (2018-10-26)

Remains valid – not updated: [JVET-L1012](http://phenix.int-evry.fr/jvet/doc_end_user/current_document.php?id=4840) JVET common test conditions and evaluation procedures for 360° video [P. Hanhart, J. Boyce, K. Choi, J.-L. Lin] (2018-10-26)

[JVET-M1021](http://phenix.int-evry.fr/jvet/doc_end_user/current_document.php?id=5751) Description of Core Experiment 1 (CE 1): Post-prediction and post-reconstruction filtering [J. Ström, S. Ikonen, V. Seregin]

[JVET-M1022](http://phenix.int-evry.fr/jvet/doc_end_user/current_document.php?id=5740) Description of Core Experiment 2 (CE2): Subblock motion compensation [C.-C. Chen, Y. He, H. Liu]

[JVET-M1023](http://phenix.int-evry.fr/jvet/doc_end_user/current_document.php?id=5746) Description of Core Experiment 3 (CE3): Intra prediction and mode coding [G. Van der Auwera, L. Li, A. Filippov]

[JVET-M1024](http://phenix.int-evry.fr/jvet/doc_end_user/current_document.php?id=5750) Description of Core Experiment 4 (CE4): Inter prediction and motion vector coding [H. Yang, G. Li, K. Zhang]

[JVET-M1025](http://phenix.int-evry.fr/jvet/doc_end_user/current_document.php?id=5744) Description of Core Experiment 5 (CE5): Adaptive loop filtering [C.-Y. Chen, V. Seregin]

[JVET-M1026](http://phenix.int-evry.fr/jvet/doc_end_user/current_document.php?id=5745) Description of Core Experiment 6 (CE6): Transforms and transform signalling [X. Zhao, H. E. Egilmez]

[JVET-M1027](http://phenix.int-evry.fr/jvet/doc_end_user/current_document.php?id=5741) Description of Core Experiment 7 (CE 7): Quantization and coefficient coding [H. Schwarz, M. Coban, C. Auyeung]

Coordination between CE7 and CE8 is desired for TS coefficient coding evaluation.

[JVET-M1028](http://phenix.int-evry.fr/jvet/doc_end_user/current_document.php?id=5748) Description of Core Experiment 8 (CE8): Screen Content Coding Tools [X. Xu, Y.-H. Chao, Y.-C. Sun, J. Xu]

Transform skip coefficient coding should be tested in CE8, and should be tested with low QP as well as with CTC.

Coordination between CE7 and CE8 is desired for TS coefficient coding evaluation.

[JVET-M1029](http://phenix.int-evry.fr/jvet/doc_end_user/current_document.php?id=5749) Description of Core Experiment 9 (CE9): Decoder Motion Vector Derivation [S. Esenlik, X. Xiu]

[JVET-M1030](http://phenix.int-evry.fr/jvet/doc_end_user/current_document.php?id=5742) Description of Core Experiment 10 (CE10): Combined inta/inter prediction [C.-W. Hsu, M. Winken]

[JVET-M1031](http://phenix.int-evry.fr/jvet/doc_end_user/current_document.php?id=5752) Description of Core Experiment 11 (CE11): Deblocking [A. Norkin, A. M. Kotra]

[JVET-M1032](http://phenix.int-evry.fr/jvet/doc_end_user/current_document.php?id=5743) Description of Core Experiment 12 (CE12): Tile set boundary motion compensation handling [Hendry, R. Skupin, W. Wan]

[JVET-M1033](http://phenix.int-evry.fr/jvet/doc_end_user/current_document.php?id=5753) Description of Core Experiment 13 (CE13): Neural-network based loop filtering [Y. Li, S. Liu, K. Kawamura]

Potentially obsolete notes: New CEs which may fill gaps in above numbering:

Adaptive loop filter [V. Seregin, …]

Post prediction/reconstruction filtering (include BF, HF, LIC, DIF) [J. Ström, S. Ikonin, …]

Neural network based loop filters [Y. Li, …]

# Future meeting plans, expressions of thanks, and closing of the meeting

Future meeting plans were established according to the following guidelines:

* Meeting under ITU-T SG 16 auspices when it meets (starting meetings on the Tuesday of the first week and closing it on the Wednesday of the second week of the SG 16 meeting – a total of 9 meeting days), and
* Otherwise meeting under ISO/IEC JTC 1/SC 29/WG 11 auspices when it meets (starting meetings on the Wednesday prior to such meetings and closing it at lunchtime on the last day of the WG 11 meeting – a total of 9.5 meeting days).

In cases where an exceptionally high workload is expected for a meeting, an earlier starting date may be defined.

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

* Wed. 3 – Fri. 12 July 2019, 15th meeting under WG 11 auspices in Gothenburg, SE.
* Tue. 1 – Wed. 9 October 2019, 16th meeting under ITU-T auspices in Geneva, CH.
* Wed. 8 – Fri. 17 January 2020, 17th meeting under WG 11 auspices in Brussels, BE.
* Wed. 15 – Fri. 24 April 2020, 18th meeting under WG 11 auspices in Alpbach, AT.

The agreed document deadline for the 15th JVET meeting was planned to be XXday XX June 2019. Plans for scheduling of agenda items within that meeting remained TBA.

ITU was thanked for the excellent hosting of the 14th meeting of the JVET.

XXXX and XXXX were thanked for providing viewing equipment used during the 14th JVET meeting. XXXX was thanked for designing and coordinating the subjective test efforts related to CE5 and CE11. The experts who helped in preparing and conducting the test, or participated in the role as test subjects, were also thanked.

The 14th JVET meeting was closed at approximately 1318 hours on Friday 18 January 2019.

# Annex A to JVET report: List of documents

# Annex B to JVET report: List of meeting participants

The participants of the fourteenth meeting of the JVET, according to a sign-in sheet circulated during the meeting sessions (approximately XXX people in total), were as follows: