

JVT-T045

Unified Syntax for Advanced 4:4:4 Profiles

Shun-ichi Sekiguchi

Mitsubishi Electric Corporation

Thomas Wedi

Panasonic R&D Center Germany

Teruhiko Suzuki

Sony Corporation

Haoping Yu

Thomson Inc.

Contents

- **Proposal of a single harmonized syntax design for advanced 4:4:4 profiles as a FPDAM-level solution**
 - Provides concrete draft text for Independent mode
 - Simply adds Independent mode feature to PDAM3 with minimum syntax modifications
- **Design for Independent mode**
 - How to unify with common mode
 - Feature clarification
- **Joint requests for finalization of 4:4:4 work**
 - **4 companies recommends the group to adopt the proposed syntax in JD3 at this meeting and promote it to FPDAM**
 - **AND ask to consider joint requests for profile discussions**

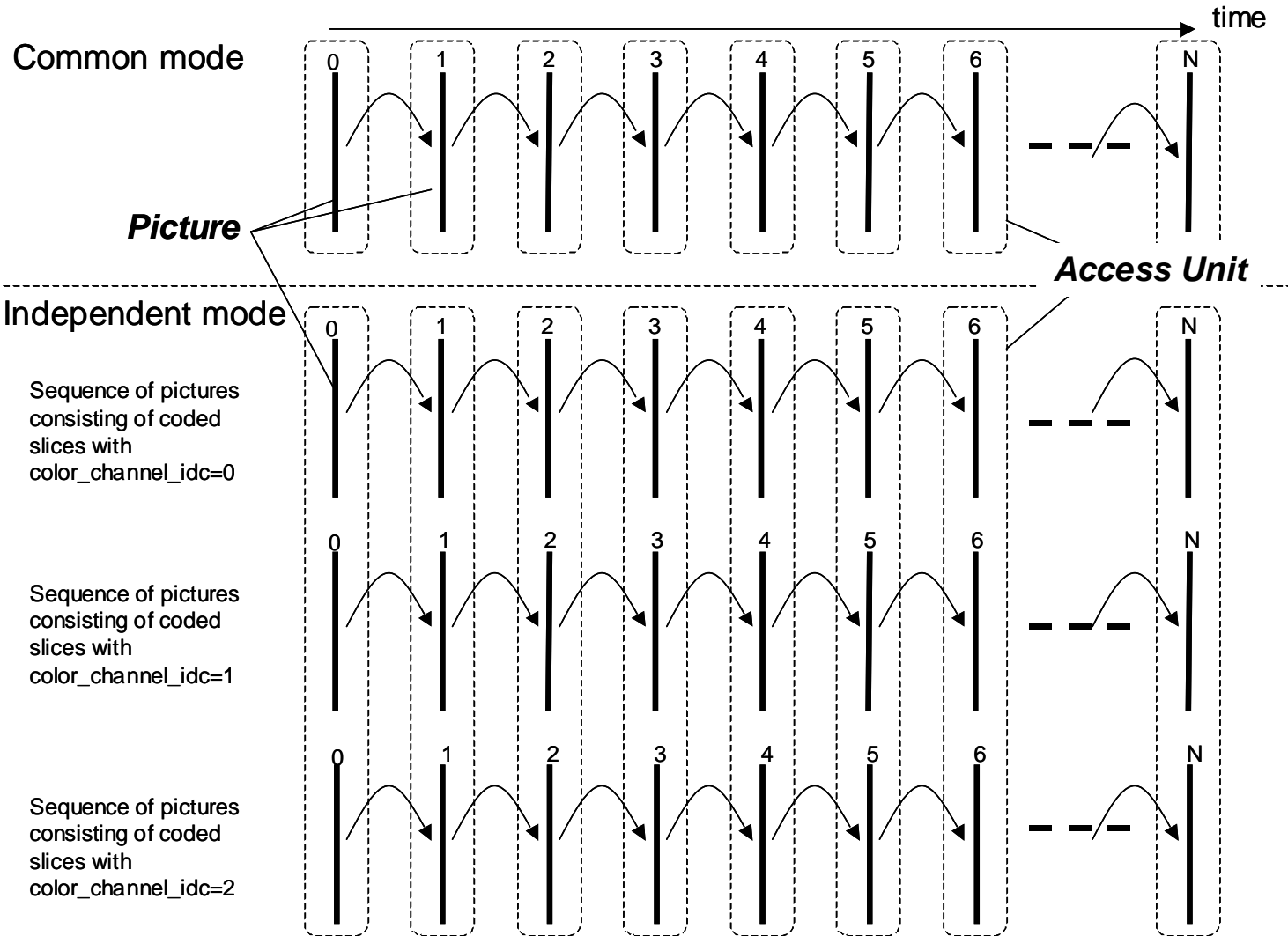
Discussion at the Geneva meeting

- From meeting note on JVT-S014 (independent mode proposal):
 - **Picture-level monochrome independence (three monochrome pictures per color picture)** would reportedly be easy to draft.
 - Our understanding is that the picture-level monochrome independent mode selection design would have approximately the same R-D performance as our current common-mode selection draft (based on HHI input). At low bit rates, we would expect the common-mode design to have better R-D performance. **We thus consider the key issue to be one of architecture, not coding efficiency.**
 - Draft syntax included, but not real, complete draft text. We need to see real draft text. **If good draft text is provided for consideration at the next meeting, we will consider adopting this.**
- This contribution is the result of consensus among 4 companies on advanced 4:4:4 syntax, which is also response to the conclusion on JVT-S014.

Design for Independent mode

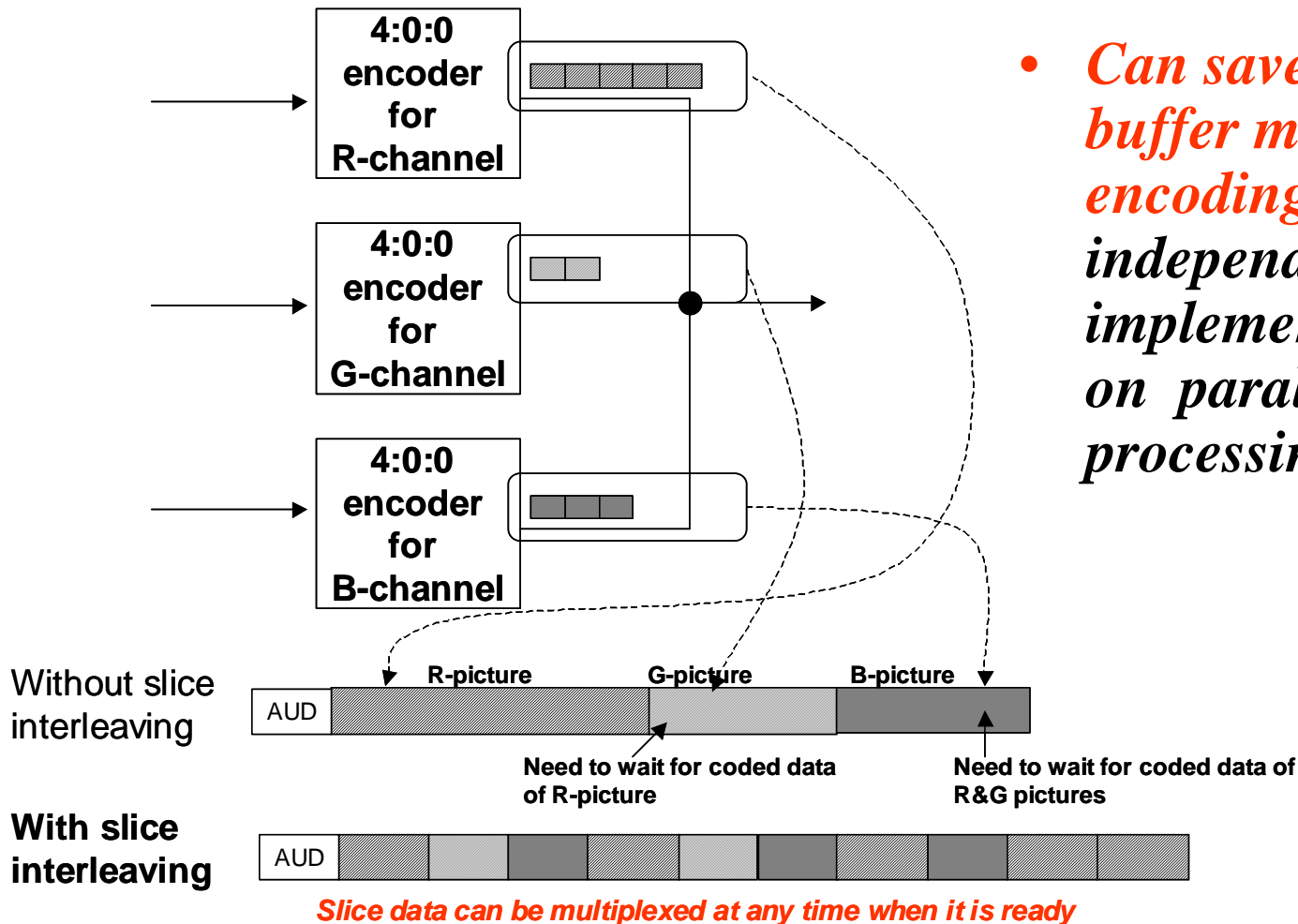
- Sequence-level common/independent mode switching
- 4:0:0 syntax as coded representation for one color channel
- *Extension of Access Unit (AU) spec.* to support more than one (independent) pictures
- *Slice-level interleaving* useful for parallel codec design
- Extensibility to support future color space having more than three colors

Access Unit and Picture



Slice-level Interleaving within an AU

- Can save stream buffer memory and encoding delay when independent mode is implemented based on parallel processing*



Proposed syntax changes

- ***Change to AU specification*** to incorporate multiple 4:0:0 pictures for independent mode
 - “num_pictures_in_au” into SPS when chroma_format is 4:4:4
 - PDAM3(common mode) when num_pictures_in_au is “1”
 - “num_pictures_in_au” can be re-used for future extension to support color spaces having more than three channels
- ***Add “color_channel_idc” at the top of slice_header()*** to indicate which color channel information is contained in the current slice
 - Allow slice-level interleaving within an AU
- ***NO changes*** to the syntax for slice data and below

See Appendix A in the document for details

Joint requests for finalization of 4:4:4 work

- **4 companies recommend the group to adopt the proposed syntax in JD3 at this meeting and promote it to FPDAM**
- AND also ask to consider the following for profile discussions:
 - Start with the proposed syntax
 - No new mandatory coding tools for early adoption of the 4:4:4 standard in the industry
 - Number of profiles should be as few as possible
 - Discuss the feasibility of creating a simple or light 4:4:4 profile that may only support parts of the proposed 4:4:4 coding approach