

**Joint Video Experts Team (JVET)  
of ITU-T SG 16 WP 3 and ISO/IEC JTC 1/SC  
29/WG 11**

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**Title:** AHG9: On generalized cubemap projection SEI message

**Status:** Input document to JVET

**Purpose:** Proposal

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**Source:** MediaTek

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Abstract

This document is Draft 4 of a standard that specifies the syntax and semantics of video usability information (VUI) parameters and supplemental enhancement information (SEI) messages for use with coded video bitstreams. The VUI parameters and SEI messages defined in this draft standard may be conveyed within coded video bitstreams in a manner specified in a video coding specification or may be conveyed by other means as determined by the specifications for systems that make use of such coded video bitstreams. This draft standard is particularly intended for use with coded video bitstreams as specified by Rec. ITU-T H.VVC | ISO/IEC 23090-3, although it is drafted in a manner intended to be sufficiently generic that it may also be used with other types of coded video bitstreams.

Editors' Notes:

Draft 4 changes:

Allow the value 6 for chroma sample location type indicators when present.

Add a byte to the decoded picture hash SEI message with a `single_component_flag` followed by 7 reserved zero bits. The width and height of each component are defined externally.

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**CARD**

<http://vexpertise.stbit.ru/documents/JVET-S0172>

The image shows a screenshot of the 'JVET Search' interface. At the top, there is a search bar with the text 'JVET Search'. Below the search bar, there are four author names: 'Ya-Hsuan Lee', 'Jian-Liang Lin', 'Y.-J. Chen', and 'C.-C. Ju'. The main title of the search result is 'AHG9: On generalized cubemap projection SEI message'. Below the title, it says 'Authors:'. There are two sections: 'ABSTRACT' and 'MEETING NOTES'. The 'ABSTRACT' section has a blue bar. The 'MEETING NOTES' section has three horizontal bars. In the bottom right corner, there is a QR code.

[https://jvet-experts.org/doc\\_end\\_user/documents/19\\_Teleconference/wg11/JVET-S0172-v2.zip](https://jvet-experts.org/doc_end_user/documents/19_Teleconference/wg11/JVET-S0172-v2.zip)

Archive

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## MEETING NOTES

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[JVET-S0172](#) AHG9: On generalized cubemap projection SEI message [Y.-H. Lee, J.-L. Lin, Y.-J. Chen, C.-C. Ju (MediaTek)]

This contribution was discussed in the HLS AHG pre-meeting at 1900 on 20 June.

This proposes the following modifications and constraints related to the generalized cubemap projection SEI message:

1. Add a condition check of `gcmp_guard_band_flag` when deriving `gcmpGuardBandSamples` to prevent from accessing an uninitialized variable.
2. Add constraints on `gcmp_face_index[ i ]` and `gcmp_face_rotation[ i ]` for the hemisphere cubemap projection to guarantee that the four half faces are the ones connecting to the full face and can represent  $180^\circ \times 180^\circ$  omnidirectional image/video. (The “if” part of the “otherwise” should be removed.)
3. Include an offset the remapping of sample locations on the half faces of the hemisphere cubemap projection.

AHG Recommendation (bug fix and sensibility constraints): Adopt.

It was asked whether each half-height / half-width is required to be an integer multiple of 2 in the 4:2:0 / 4:2:2 cases, to avoid half-chroma samples.

Offline work by the proponent was requested to establish this constraint.

This was further discussed in the main JVET meeting at 1430 on 25 June (chaired by GJS).

A -v2 version of the contribution was provided that includes the requested constraint. It was commented that although the spirit of the constraint is clear in the provided text, it may be better to derive specific variables and constrain their values rather than to use verbal expressions such as “the width of each face”.

Editor action item: The contributor and editor were asked to consider the above suggestion in the text finalization.

## CITATION

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Y.-H. Lee, J.-L. Lin, Y.-J. Chen, C.-C. Ju, "AHG9: On generalized cubemap projection SEI message", JVET-S0172, 19th Meeting: by teleconference, June 2020.

## REFERENCES

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2. [S. McCarthy, T. Lu, F. Pu, P. Yin, W. Husak, T. Chen, "AHG17: On porting SEI messages specified in HEVC and AVC", JVET-P0337, 16th Meeting: Geneva, October 2019.](#)
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4. [R. Skupin, Y. Sanchez, K. Suehring, T. Schierl, "AHG17: On Sample Aspect Ratio for RPR", JVET-P0450, 16th Meeting: Geneva, October 2019.](#)
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8. [Y.-H. Lee, J.-L. Lin, Y.-J. Chen, C.-C. Ju, "AHG6/AHG9: Signalling guard band type for generalized cubemap projection", JVET-Q0343, 17th Meeting: Brussels, January 2020.](#)
9. [V. Drugeon, Y.-K. Wang, "Moving the frame-field information SEI message to the SEI specification", JVET-Q0818, 17th Meeting: Brussels, January 2020.](#)
10. [V. Drugeon, "AHG9: On Video Usability Information", JVET-R0090, 18th Meeting: Teleconference, April 2020.](#)
11. [B. Bross, J. Chen, S. Liu, Y.-K. Wang, "Versatile Video Coding \(Draft 9\)", JVET-R2001, 18th Meeting: Teleconference, April 2020.](#)