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## Information technology — Coding of audio-visual objects —

### Part 10: **Advanced Video Coding**

#### **AMENDMENT 1: Multi-Resolution frame compatible stereoscopic video with depth maps, additional supplemental enhancement information and video usability information**

*Technologies de l'information — Codage des objets audiovisuels —*

*Partie 10: Codage visuel avancé*

*AMENDEMENT 1: Vidéo stéréoscopique multi-résolution à cadre  
compatible avec cartes de profondeur, information additionnelle  
d'amélioration supplémentaire et information relative à  
l'utilisabilité de la vidéo*



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ISO copyright office  
Ch. de Blandonnet 8 • CP 401  
CH-1214 Vernier, Geneva, Switzerland  
Tel. +41 22 749 01 11  
Fax +41 22 749 09 47  
copyright@iso.org  
www.iso.org

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The committee responsible for this document is ISO/IEC JTC 1, *Information technology*, Subcommittee SC 29, *Coding of audio, picture, multimedia and hypermedia information*.



# Information technology — Coding of audio-visual objects —

## Part 10:

## Advanced Video Coding

### AMENDMENT 1: Multi-Resolution frame compatible stereoscopic video with depth maps, additional supplemental enhancement information and video usability information

Page xvi, 0.4

At the end of 0.4, add the following:

Rec. ITU T H.264 | ISO/IEC 14496-10 version 23 (the current Specification) refers to the integrated version 22 text after its amendment to specify multi-resolution frame-compatible (MFC) stereoscopic video with depth maps, including the specification of an additional profile, the MFC Depth High profile, and the mastering display colour volume SEI message, additional colour-related video usability information codepoint identifiers, and miscellaneous minor corrections and clarifications.

Page xx, 0.7

Replace the sentence

Subclause I.10 specifies one profile for MVCD (Multiview and Depth).

with

Subclause I.10 specifies two profiles for MVCD (Multiview Depth High, and MFC Depth High).

Page 42, 7.3.2.1.1

Replace the syntax table with the following:

| seq_parameter_set_data( ) {                 | C | Descriptor |
|---------------------------------------------|---|------------|
| <b>profile_idc</b>                          | 0 | u(8)       |
| <b>constraint_set0_flag</b>                 | 0 | u(1)       |
| <b>constraint_set1_flag</b>                 | 0 | u(1)       |
| <b>constraint_set2_flag</b>                 | 0 | u(1)       |
| <b>constraint_set3_flag</b>                 | 0 | u(1)       |
| <b>constraint_set4_flag</b>                 | 0 | u(1)       |
| <b>constraint_set5_flag</b>                 | 0 | u(1)       |
| <b>reserved_zero_2bits</b> /* equal to 0 */ | 0 | u(2)       |
| <b>level_idc</b>                            | 0 | u(8)       |
| <b>seq_parameter_set_id</b>                 | 0 | ue(v)      |

|                                                                                                                                                                                                                                                                                                             |   |       |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|-------|
| if( profile_idc == 100    profile_idc == 110   <br>profile_idc == 122    profile_idc == 244    profile_idc == 44   <br>profile_idc == 83    profile_idc == 86    profile_idc == 118   <br>profile_idc == 128    profile_idc == 138    profile_idc == 139   <br>profile_idc == 134    profile_idc == 135 ) { |   |       |
| <b>chroma_format_idc</b>                                                                                                                                                                                                                                                                                    | 0 | ue(v) |
| if( chroma_format_idc == 3 )                                                                                                                                                                                                                                                                                |   |       |
| <b>separate_colour_plane_flag</b>                                                                                                                                                                                                                                                                           | 0 | u(1)  |
| <b>bit_depth_luma_minus8</b>                                                                                                                                                                                                                                                                                | 0 | ue(v) |
| <b>bit_depth_chroma_minus8</b>                                                                                                                                                                                                                                                                              | 0 | ue(v) |
| <b>qpprime_y_zero_transform_bypass_flag</b>                                                                                                                                                                                                                                                                 | 0 | u(1)  |
| <b>seq_scaling_matrix_present_flag</b>                                                                                                                                                                                                                                                                      | 0 | u(1)  |
| if( seq_scaling_matrix_present_flag )                                                                                                                                                                                                                                                                       |   |       |
| for ( i = 0; i < ( ( chroma_format_idc != 3 ) ? 8 : 12 ); i++ ) {                                                                                                                                                                                                                                           |   |       |
| <b>seq_scaling_list_present_flag[ i ]</b>                                                                                                                                                                                                                                                                   | 0 | u(1)  |
| if( seq_scaling_list_present_flag[ i ] )                                                                                                                                                                                                                                                                    |   |       |
| if( i < 6 )                                                                                                                                                                                                                                                                                                 |   |       |
| scaling_list( ScalingList4x4[ i ], 16,<br>UseDefaultScalingMatrix4x4Flag[ i ] )                                                                                                                                                                                                                             | 0 |       |
| else                                                                                                                                                                                                                                                                                                        |   |       |
| scaling_list( ScalingList8x8[ i - 6 ], 64,<br>UseDefaultScalingMatrix8x8Flag[ i - 6 ] )                                                                                                                                                                                                                     | 0 |       |
| }                                                                                                                                                                                                                                                                                                           |   |       |
| }                                                                                                                                                                                                                                                                                                           |   |       |
| <b>log2_max_frame_num_minus4</b>                                                                                                                                                                                                                                                                            | 0 | ue(v) |
| <b>pic_order_cnt_type</b>                                                                                                                                                                                                                                                                                   | 0 | ue(v) |
| if( pic_order_cnt_type == 0 )                                                                                                                                                                                                                                                                               |   |       |
| <b>log2_max_pic_order_cnt_lsb_minus4</b>                                                                                                                                                                                                                                                                    | 0 | ue(v) |
| else if( pic_order_cnt_type == 1 ) {                                                                                                                                                                                                                                                                        |   |       |
| <b>delta_pic_order_always_zero_flag</b>                                                                                                                                                                                                                                                                     | 0 | u(1)  |
| <b>offset_for_non_ref_pic</b>                                                                                                                                                                                                                                                                               | 0 | se(v) |
| <b>offset_for_top_to_bottom_field</b>                                                                                                                                                                                                                                                                       | 0 | se(v) |
| <b>num_ref_frames_in_pic_order_cnt_cycle</b>                                                                                                                                                                                                                                                                | 0 | ue(v) |
| for( i = 0; i < num_ref_frames_in_pic_order_cnt_cycle; i++ )                                                                                                                                                                                                                                                |   |       |
| <b>offset_for_ref_frame[ i ]</b>                                                                                                                                                                                                                                                                            | 0 | se(v) |
| }                                                                                                                                                                                                                                                                                                           |   |       |
| <b>max_num_ref_frames</b>                                                                                                                                                                                                                                                                                   | 0 | ue(v) |
| <b>gaps_in_frame_num_value_allowed_flag</b>                                                                                                                                                                                                                                                                 | 0 | u(1)  |
| <b>pic_width_in_mbs_minus1</b>                                                                                                                                                                                                                                                                              | 0 | ue(v) |
| <b>pic_height_in_map_units_minus1</b>                                                                                                                                                                                                                                                                       | 0 | ue(v) |
| <b>frame_mbs_only_flag</b>                                                                                                                                                                                                                                                                                  | 0 | u(1)  |
| if( !frame_mbs_only_flag )                                                                                                                                                                                                                                                                                  |   |       |
| <b>mb_adaptive_frame_field_flag</b>                                                                                                                                                                                                                                                                         | 0 | u(1)  |

|                                    |   |       |
|------------------------------------|---|-------|
| <b>direct_8x8_inference_flag</b>   | 0 | u(1)  |
| <b>frame_cropping_flag</b>         | 0 | u(1)  |
| if( frame_cropping_flag ) {        |   |       |
| <b>frame_crop_left_offset</b>      | 0 | ue(v) |
| <b>frame_crop_right_offset</b>     | 0 | ue(v) |
| <b>frame_crop_top_offset</b>       | 0 | ue(v) |
| <b>frame_crop_bottom_offset</b>    | 0 | ue(v) |
| }                                  |   |       |
| <b>vui_parameters_present_flag</b> | 0 | u(1)  |
| if( vui_parameters_present_flag )  |   |       |
| vui_parameters                     | 0 |       |
| }                                  |   |       |

Page 45, 7.3.2.1.3

Replace the syntax table with the following:

|                                                                               | C | Descriptor |
|-------------------------------------------------------------------------------|---|------------|
| subset_seq_parameter_set_rbsp( ) {                                            |   |            |
| seq_parameter_set_data( )                                                     | 0 |            |
| if( profile_idc == 83    profile_idc == 86 ) {                                |   |            |
| seq_parameter_set_svc_extension( ) /* specified in Annex G */                 | 0 |            |
| <b>svc_vui_parameters_present_flag</b>                                        | 0 | u(1)       |
| if( svc_vui_parameters_present_flag == 1 )                                    |   |            |
| svc_vui_parameters_extension( ) /* specified in Annex G */                    | 0 |            |
| } else if( profile_idc == 118    profile_idc == 128    profile_idc == 134 ) { |   |            |
| <b>bit_equal_to_one</b> /* equal to 1 */                                      | 0 | f(1)       |
| seq_parameter_set_mvc_extension( ) /* specified in Annex H */                 | 0 |            |
| <b>mvc_vui_parameters_present_flag</b>                                        | 0 | u(1)       |
| if( mvc_vui_parameters_present_flag == 1 )                                    |   |            |
| mvc_vui_parameters_extension( ) /* specified in Annex H */                    | 0 |            |
| } else if( profile_idc == 138    profile_idc == 135 ) {                       |   |            |
| <b>bit_equal_to_one</b> /* equal to 1 */                                      | 0 | f(1)       |
| seq_parameter_set_mvcd_extension( ) /* specified in Annex I */                |   |            |
| } else if( profile_idc == 139 ) {                                             |   |            |
| <b>bit_equal_to_one</b> /* equal to 1 */                                      | 0 | f(1)       |
| seq_parameter_set_mvcd_extension( ) /* specified in Annex I */                |   |            |
| seq_parameter_set_3davc_extension( ) /* specified in Annex J */               | 0 |            |
| }                                                                             |   |            |
| <b>additional_extension2_flag</b>                                             | 0 | u(1)       |
| if( additional_extension2_flag == 1 )                                         |   |            |
| while( more_rbsp_data( ) )                                                    |   |            |
| <b>additional_extension2_data_flag</b>                                        | 0 | u(1)       |
| rbsp_trailing_bits( )                                                         | 0 |            |
| }                                                                             |   |            |

Page 346, D.1

Insert the following before the row containing only “else”:

|                                                |   |  |
|------------------------------------------------|---|--|
| else if( payloadType == 137 )                  |   |  |
| mastering_display_colour_volume( payloadSize ) | 5 |  |

Page 360, D.1.27

Renumber D.1.27 as D.1.28.

Add the following new subclause as D.1.27:

#### D.1.27 Mastering display colour volume SEI message syntax

| mastering_display_colour_volume( payloadSize ) { | C | Descriptor |
|--------------------------------------------------|---|------------|
| for( c = 0; c < 3; c++ ) {                       |   |            |
| display primaries_x[ c ]                         | 5 | u(16)      |
| display primaries_y[ c ]                         | 5 | u(16)      |
| }                                                |   |            |
| white_point_x                                    | 5 | u(16)      |
| white_point_y                                    | 5 | u(16)      |
| max_display_mastering_luminance                  | 5 | u(32)      |
| min_display_mastering_luminance                  | 5 | u(32)      |
| }                                                |   |            |

Page 405, D.2.27

Renumber D.2.27 as D.2.28.

Add the following new subclause as D.2.27:

#### D.2.27 Mastering display colour volume SEI message semantics

This SEI message identifies the colour volume (the colour primaries, white point, and luminance range) of a display considered to be the mastering display for the associated video content, e.g. the colour volume of a display that was used for viewing while authoring the video content. The described mastering display is a three-colour additive display system that has been configured to use the indicated mastering colour volume.

This SEI message does not specify the measurement methodologies and procedures used for determining the indicated values or any description of the mastering environment. It also does not provide information on colour transformations that would be appropriate to preserve creative intent on displays with colour volumes different from that of the described mastering display.

The information conveyed in this SEI message is intended to be adequate for purposes corresponding to the use of Society of Motion Picture and Television Engineers ST 2086.

The following constraints apply for the presence of mastering display colour volume SEI messages in IDR access units:

- when a mastering display colour volume SEI message is present in any access unit of a coded video sequence and the mastering display colour volume SEI message is not contained within any other SEI message, a mastering display colour volume SEI message that is not contained within any other SEI message shall be present in the IDR access unit that is the first access unit of the coded video sequence;
- when a mastering display colour volume SEI message is present in any access unit of a coded video sequence and the mastering display colour volume SEI message is contained in a scalable