**3GPP TSG SA WG4 #113e *S4-210609***

**E-meeting, 6th – 14th April 2021**

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| *CR-Form-v12.0* |
| **draft CHANGE REQUEST** |
|  |
|  | **26.116** | **CR** | **<CR#>** | **rev** | **-** | **Current version:** | **16.2.0** |  |
|  |
| *For* [***HE******LP***](http://www.3gpp.org/3G_Specs/CRs.htm#_blank)*on using this form: comprehensive instructions can be found at* [*http://www.3gpp.org/Change-Requests*](http://www.3gpp.org/Change-Requests)*.* |
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| ***Proposed change affects:*** | UICC apps |  | ME | **X** | Radio Access Network |  | Core Network | **X** |

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|  |
| ***Title:***  | Addition of Chroma Sample Location Type for BT.2020 |
|  |  |
| ***Source to WG:*** | Qualcomm Incorporated |
| ***Source to TSG:*** | S4 |
|  |  |
| ***Work item code:*** | TEI16 |  | ***Date:*** | 2021-03-31 |
|  |  |  |  |  |
| ***Category:*** | **F** |  | ***Release:*** | Rel-16 |
|  | *Use one of the following categories:****F*** *(correction)****A*** *(mirror corresponding to a change in an earlier release)****B*** *(addition of feature),* ***C*** *(functional modification of feature)****D*** *(editorial modification)*Detailed explanations of the above categories canbe found in 3GPP [TR 21.900](http://www.3gpp.org/ftp/Specs/html-info/21900.htm). | *Use one of the following releases:Rel-8 (Release 8)Rel-9 (Release 9)Rel-10 (Release 10)Rel-11 (Release 11)Rel-12 (Release 12)**Rel-13 (Release 13)Rel-14 (Release 14)Rel-15 (Release 15)Rel-16 (Release 16)* |
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| ***Reason for change:*** | For BT.2020, the chroma\_sample\_loc\_type\_top\_field in the VUI needs to be set to 2. |
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| ***Summary of change:*** | Sets the value for profiles that may use BT.2020 |
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| ***Consequences if not approved:*** | Ambigous specification leading to interop problems |
|  |  |
| ***Clauses affected:*** | 4.5.3.5, 4.5.4.5, 4.5.5.5, 4.5.6.5, 4.5.7.5, 4.5.8.5, |
|  |  |
|  | **Y** | **N** |  |  |
| ***Other specs*** |  | **X** |  Other core specifications  | TS/TR ... CR ...  |
| ***affected:*** |  | **X** |  Test specifications | TS/TR ... CR ...  |
| ***(show related CRs)*** |  | **X** |  O&M Specifications | TS/TR ... CR ...  |
|  |  |
| ***Other comments:*** |  |
| ***56***  |  |
| ***This CR's revision history:*** |  |

**===== CHANGE =====**

#### 4.5.3.5 Colour information

A Bitstream conforming to the H.265/HEVC Full HD Operation Point shall use either Recommendation ITU-R BT.709 [3] colorimetry or Recommendation ITU-R BT.2020 [4] colorimetry in non-constant luminance.

- BT.709 [3] shall be signalled by setting colour\_primaries to the value 1, transfer\_characteristics to the value 1 and matrix\_coeffs to the value 1.

- BT.2020 [4] shall be signalled by setting colour\_primaries to the value 9, transfer\_characteristics to the value 14 and matrix\_coeffs to the value 9. The chroma\_sample\_loc\_type\_top\_field shall be set to 2.

A Receiver conforming to the H.265/HEVC Full HD Operation Point shall be capable of decoding Bitstreams that use Recommendation ITU-R BT.709 [3] and ITU-R BT.2020 [4] colorimetry. Such a Receiver should support ITU-R BT.2020 [4] signalling and provide an appropriate mapping of the signal to the supported colour space of the device.

NOTE: Colour spaces are not associated to any particular spatial resolution.

**===== CHANGE =====**

#### 4.5.4.5 Colour information

A Bitstream conforming to the H.265/HEVC UHD Operation Point shall use Recommendation ITU-R BT.2020 [4] colorimetry in non-constant luminance.

- BT.2020 [4] shall be signalled by setting colour\_primaries to the value 9, transfer\_characteristics to the value 14 and matrix\_coeffs to the value 9. The chroma\_sample\_loc\_type\_top\_field shall be set to 2.

A Receiver conforming to the H.265/HEVC UHD Operation Point shall be capable of decoding Bitstreams that use ITU-R BT.2020 [4] colorimetry. Such a Receiver should support ITU-R BT.2020 [4] signalling and provide an appropriate mapping of the signal to the supported colour space of the device.

**===== CHANGE =====**

#### 4.5.5.5 Colour information and HDR transfer characteristics

A Bitstream conforming to the H.265/HEVC Full HD HDR Operation Point that uses PQ HDR shall comply with the following restrictions in the VUI:

- colour\_primaries shall be set to the value 9,

- transfer\_characteristics shall be set to the value 16,

- matrix\_coeffs shall be set to the value 9.

- The chroma\_sample\_loc\_type\_top\_field shall be set to 2.

This signalling implies that BT.2020 [4] colorimetry in non-constant luminance and Perceptual Quantization (PQ) electro-optical transfer function (EOTF) as defined in Recommendation ITU-R BT.2100 [11] are in use.

**===== CHANGE =====**

#### 4.5.6.5 Colour information and HDR transfer characteristics

A Bitstream conforming to the H.265/HEVC UHD HDR Operation Point that uses PQ HDR shall comply with the following restrictions in the VUI:

- colour\_primaries shall be set to the value 9,

- transfer\_characteristics shall be set to the value 16,

- matrix\_coeffs shall be set to the value 9.

- The chroma\_sample\_loc\_type\_top\_field shall be set to 2.

This signalling implies that Recommendation BT.2020 [4] colorimetry in non-constant luminance and Perceptual Quantization (PQ) electro-optical transfer function (EOTF) as defined in Recommendation ITU-R BT.2100 [11] are in use.

**===== CHANGE =====**

#### 4.5.7.5 Colour information and HDR transfer characteristics

A Bitstream conforming to the H.265/HEVC Full HD HDR HLG Operation Point shall comply with the following restrictions in the VUI:

- colour\_primaries shall be set to the value 9,

- transfer\_characteristics shall be set to either the value 18, or to the value 14. In the latter case, the Bitstream shall also contain the alternative\_transfer\_characteristics SEI message. The alternative\_transfer\_characteristics SEI message shall be inserted at each RAP, and its parameter preferred\_transfer\_characteristics shall be set to the value 18.

- matrix\_coeffs shall be set to the value 9.

- The chroma\_sample\_loc\_type\_top\_field shall be set to 2.

This signalling implies that BT.2020 [4] colorimetry in non-constant luminance and Hybrid Log Gamma (HLG) electro-optical transfer function (EOTF) as defined in Recommendation ITU-R BT.2100 [11] are in use.

**===== CHANGE =====**

#### 4.5.8.5 Colour information and HDR transfer characteristics

A Bitstream conforming to the H.265/HEVC UHD HDR HLG Operation Point shall comply with the following restrictions in the VUI:

- colour\_primaries shall be set to the value 9,

- transfer\_characteristics shall be set to either the value 18, or to the value 14. In the latter case, the Bitstream shall also contain the alternative\_transfer\_characteristics SEI message. The alternative\_transfer\_characteristics SEI message shall be inserted at each RAP, and its parameter preferred\_transfer\_characteristics shall be set to the value 18.

- matrix\_coeffs shall be set to the value 9.

- The chroma\_sample\_loc\_type\_top\_field shall be set to 2.

This signalling implies that Recommendation BT.2020 [4] colorimetry in non-constant luminance and Hybrid Log Gamma (HLG) electro-optical transfer function (EOTF) as defined in Recommendation ITU-R BT.2100 [11] are in use.