**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 can be 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)* | |
|  |  | | | | | | | | | |
| ***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.