**3GPP TSG-RAN4 Meeting #95-e *R4-2009007***

**Electronic Meeting, 25 May – 5 June, 2020**

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| *CR-Form-v12.0* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **38.133** | **CR** | **0795** | **rev** | **1** | **Current version:** | **16.3.0** |  |
|  | | | | | | | | |
| *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 |  |

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| ***Title:*** | CR on CSI-RS based measurement requirements | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | Huawei, HiSilicon | | | | | | | | | |
| ***Source to TSG:*** | R4 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | NR\_CSIRS\_L3meas-Core | | | | |  | ***Date:*** | | | 2020-05-11 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | **B** |  | | | | | ***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:*** | | CSI-RS based measurement requirements needs to be defined. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | Specify CSI-RS based measurement requirements  -CSI-RS intra-frequency measurement without gap | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | CSI-RS measurement requirements are incomplete. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | New section 9.9 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **Y** | **N** |  | | | |  | | |
| ***Other specs*** | |  |  | Other core specifications | | | | TS/TR ... CR ... | | |
| ***affected:*** | |  |  | Test specifications | | | | TS/TR ... CR ... | | |
| ***(show related CRs)*** | |  |  | O&M Specifications | | | | TS/TR ... CR ... | | |
|  | |  | | | | | | | | |
| ***Other comments:*** | |  | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | |  | | | | | | | | |

<Start of Change 1>

#### 9.9.2.4 Measurement Reporting Requirements

9.9.2.4.1 Periodic Reporting

Reported CSI-RSRP, CSI-RSRQ, and CSI-SINR measurements contained in periodic measurement reports shall meet the requirements in clauses 10.1.

9.9.2.4.2 Event-triggered Periodic Reporting

Reported CSI-RSRP, CSI-RSRQ, and CSI-SINR measurements contained in event-triggered periodic measurement reports shall meet the requirements in clauses 10.1.

The first report in event triggered periodic measurement reporting shall meet the requirements specified in clause 9.9.2.4.3.

9.9.2.4.3 Event Triggered Reporting

Reported CSI-RSRP, CSI-RSRQ, and CSI- SINR measurements contained in event triggered measurement reports shall meet the requirements in clauses 10.1.

The UE shall not send any event triggered measurement reports as long as no reporting criteria is fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTIDCCH. This measurement reporting delay excludes a delay which caused by no UL resources being available for UE to send the measurement report on.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than the CSI-RS based measurement defined in clause 9.9.2.5. When L3 filtering is used an additional delay can be expected.

#### 9.9.2.5 Intra-frequency measurements without measurement gaps

If a UE is configured with the higher layer parameters *CSI-RS-Resource-Mobility* and *associatedSSB*, the UE may base the timing of the CSI-RS resource on the timing of the cell given by the *cellId* of the CSI-RS resource configuration. Additionally, for a given CSI-RS resource, if the associated SS/PBCH block is configured but not detected by the UE, or if CSI-RS configured with associated SSB but not QCL-ed to the associated SSB, the UE is not required to monitor the corresponding CSI-RS resource.

If *associatedSSB* is unknown, the CSI-RS based measurement shall include PSS/SSS detection time of associatedSSB, the time period used to acquire the SFN information and CSI-RS based measurement period without gap.

* PSS/SSS detection time of associatedSSB is the intra-frequency TPSS/SSS\_sync\_intra in Section 9.2.5.1 or in section 9.2.6.2 or inter-frequency TPSS/SSS\_sync\_inter in section 9.3.4.
* The time period used to acquire the SFN information is intra-frequency TSSB\_time\_index\_intra in Section 9.2.5.1 or in section 9.2.6.2 or inter-frequency TSSB\_time\_index\_inter in section 9.3.4.
* The measurement period for intrafrequency measurements without gaps is as shown in table 9.9.2.5-1, Table 9.9.2.5-2.

If *associatedSSB* is known, the CSI-RS based measurement shall only include the measurement period for intrafrequency measurements without gaps as shown in table 9.9.2.5-1, 9.9.2.5-2.

*Editeral note: the requirements for the case that the multiple CSI-RS resources from different cells are transmitted in the same OFDM symbols in one MO, and the CSI-RS resources are QCL-ed with different associated SSB are FFS.*

**Table 9.9.2.5-1: Measurement period for intrafrequency CSI-RS based measurements without gaps(Frequency FR1)**

|  |  |
| --- | --- |
| **DRX cycle** | **T CSI-RS\_measurement\_period\_intra** |
| No DRX | max(200ms, ceil( 5 x Kp) x CMTC period) x CSSFintra\_CSI-RS |
| DRX cycle≤ 320ms | max(200ms, ceil(1.5x 5 x Kp) x max(CMTC period,DRX cycle)) x CSSFintra\_CSI-RS |
| DRX cycle>320ms | ceil( 5 x Kp ) x DRX cycle x CSSFintra\_CSI-RS |
| NOTE 1: The requirements apply assuming CSI-RS configuration with {D=3 with PRBs ≥ 48}. | |

**Table 9.8.2.5-2: Measurement period for intrafrequency CSI-RS based measurements without gaps(Frequency FR2)**

|  |  |
| --- | --- |
| **DRX cycle** | **T CSI-RS\_measurement\_period\_intra** |
| No DRX | max(400ms, ceil(Mmeas\_period\_w/o\_gaps x Kp x Klayer1\_measurement) x CMTC period) x CSSFintra\_CSI-RS |
| DRX cycle≤ 320ms | max(400ms, ceil(1.5x Mmeas\_period\_w/o\_gaps x Kp x Klayer1\_measurement) x max(CMTC period,DRX cycle)) x CSSFintra \_CSI-RS |
| DRX cycle>320ms | ceil(Mmeas\_period\_w/o\_gaps x Klayer1\_measurement ) x DRX cycle x CSSFintra\_CSI-RS |
| NOTE 1: The requirements apply assuming CSI-RS configuration with {D=3 with PRBs ≥ 48}. | |

Mmeas\_period\_w/o\_gaps : For a UE supporting power class 1, Mmeas\_period\_w/o\_gaps =40. For a UE supporting FR2 power class 2, Mmeas\_period\_w/o\_gaps =24. For a UE supporting power class 3, Mmeas\_period\_w/o\_gaps =24. For a UE supporting power class 4, Mmeas\_period\_w/o\_gaps =24.

CSSFintra\_CSI-RS: it is a carrier specific scaling factor and is determined according to CSSFoutside\_gap,i\_CSI-RS in clause 9.1.5.

<End of Change 1>