**3GPP TSG-RAN4 Meeting #95-eR4-2009099**

**Electronic meeting, 25th May – 5th June, 2020**

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| *CR-Form-v11.2* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **38.133** | **CR** | **0884** | **rev** | **-** | **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 inter-frequency CSI-RS L3 measurement requirement | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | OPPO | | | | | | | | | |
| ***Source to TSG:*** | RAN4 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | NR\_CSIRS\_L3meas-Core | | | | |  | | ***Date:*** | | 2020-5-25 |
|  |  | | | |  | | |  | |  |
| ***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 L3 measurement requirements should be introduced in Rel-16. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | Introduce CSI-RS based inter-frequency measurement requirements: | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | CSI-RS inter-frequency measurements requirements are missing. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | Section 9.9 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **Y** | **N** |  | | |  | | | |
| ***Other specs*** | |  | **X** | Other core specifications | | |  | | | |
| ***affected:*** | | **X** |  | Test specifications | | | TS 38.521-3 | | | |
| ***(show related CRs)*** | |  | **X** | O&M Specifications | | |  | | | |
|  | |  | | | | | | | | |
| ***Other comments:*** | |  | | | | | | | | |

<< Start of Change #1>>

### 9.9.3.4 Measurements reporting requirements

#### 9.9.3.4.1 Periodic Reporting

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

#### 9.9.3.4.2 Event-triggered Periodic Reporting

Reported CSI-RSRP, CSI-RSRQ, and CSI-SINR measurements contained in periodically triggered 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 9.9.3.4.3.

#### 9.9.3.4.3 Event-triggered Reporting

Reported CSI-RSRP, CSI-RSRQ, and CSI-SINR measurements contained in periodically 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 are 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 × TTIDCCH. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be within CSI-RS based measurement defined in clause 9.9.3.5.When L3 filtering is used an additional delay can be expected.

### 9.9.3.5 Inter frequency measurements with measurement gaps

When measurement gaps are provided, if configured with the higher layer parameters *CSI-RS-Resource-Mobility* and *associatedSSB,* the UE shall be able to identify a new detectable CSI-RS based inter frequency cell within T CSI-RS\_identify\_inter\_with\_index, If UE has already detected the *associatedSSB* of the target cell and deriveSSB-IndexFromCell is indicated, the CSI-RS based measurement shall only include TCSI-RS\_measurement\_period\_inter.

T CSI-RS\_identify\_inter\_with\_index = (TPSS/SSS\_sync + T CSI-RS\_measurement\_period\_inter + TSSB\_time\_index) ms

Where:

TPSS/SSS\_sync is the time period used in PSS/SSS detection and TSSB\_time\_index is the time period used to acquire the index of the SSB being measured, [which are determined [according to TPSS/SSS\_sync\_intra and TSSB\_time\_index\_intra given in clause 9.2.5 for SSB based intra-frequency measurements, or] according to TPSS/SSS\_sync\_inter and TSSB\_time\_index\_inter given in clause 9.3.4 for SSB based inter-frequency measurement,

TCSI-RS\_measurement\_period\_inter: equal to a measurement period of CSI-RS based measurement given in table 9.9.3.5-1 and table 9.9.3.5-2.

Mmeas\_period\_inter: For a UE supporting FR2 power class 1, Mmeas\_period\_inter =64 samples. For a UE supporting FR2 power class 2, Mmeas\_period\_inter=40 samples. For a UE supporting FR2 power class 3, Mmeas\_period\_inter =40 samples. For a UE supporting FR2 power class 4, Mmeas\_period\_inter = 40 samples.

CSSFinter: it is a carrier specific scaling factor and is determined according to CSSFwithin\_gap,i in clause 9.1.5 for measurement conducted within measurement gaps.

Additionally, for a given CSI-RS resource, if the associated SSB 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.

**Table 9.9.3.5-1: Measurement period for CSI-RS based inter-frequency measurements with gaps (Frequency FR1)**

|  |  |
| --- | --- |
| **Condition NOTE1,2** | **T CSI-RS\_measurement\_period\_inter** |
| No DRX | Max(200ms, 8 × Max(MGRP, CSI-RS period)) × CSSFinter |
| DRX cycle ≤ 320ms | Max(200ms, Ceil(8 × 1.5) × Max(MGRP, CSI-RS period, DRX cycle)) × CSSFinter |
| DRX cycle > 320ms | 8 × DRX cycle × CSSFinter |
| NOTE 1: DRX or non DRX requirements apply according to the conditions described in clause 3.6.1  NOTE 2: In EN-DC operation, the parameters, timers and scheduling requests referred to in clause 3.6.1 are for the secondary cell group. The DRX cycle is the DRX cycle of the secondary cell group. | |

**Table 9.9.3.5-2: Measurement period for CSI-RS based inter-frequency measurements with gaps (Frequency FR2)**

|  |  |
| --- | --- |
| **Condition NOTE1,2** | **T CSI-RS\_measurement\_period\_inter** |
| No DRX | Max(400ms, Mmeas\_period\_inter × Max(MGRP, CSI-RS period)) × CSSFinter |
| DRX cycle ≤ 320ms | Max(400ms, (1.5 × Mmeas\_period\_inter) × Max(MGRP, CSI-RS period, DRX cycle)) × CSSFinter |
| DRX cycle > 320ms | Mmeas\_period\_inter × DRX cycle × CSSFinter |
| NOTE 1: DRX or non DRX requirements apply according to the conditions described in clause 3.6.1  NOTE 2: In EN-DC operation, the parameters, timers and scheduling requests referred to in clause 3.6.1 are for the secondary cell group. The DRX cycle is the DRX cycle of the secondary cell group. | |

<< End of Change #1>>