**3GPP TSG-RAN4 Meeting #95-e *R4-2009006***

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

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| *CR-Form-v11.2* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
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|  | **38.133** | **CR** | **0639** | **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 intra-frequency measurement requirement (Introduction, requirement applicability and number of cell and beams) | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | CATT | | | | | | | | | |
| ***Source to TSG:*** | R4 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | NR\_CSIRS\_L3meas-Core | | | | |  | | ***Date:*** | | 2020-5-5 |
|  |  | | | |  | | |  | |  |
| ***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)* | |
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| ***Reason for change:*** | | CSI-RS L3 measurement was introduced in Rel-16, hence the CSI-RS based intra-frequency measurement requirements shall be introduced. | | | | | | | | |
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| ***Summary of change:*** | | Introduce section introduction, requirement applicability and number of cell and beams for CSI-RS based intra-frequency measurement. | | | | | | | | |
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| ***Consequences if not approved:*** | | CSI-RS based intra-frequency measurement requirements are missing. | | | | | | | | |
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| ***Clauses affected:*** | | New section 9.x.2 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **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:*** | |  | | | | | | | | |

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<< Start of Change #1>>

## 9.x.2 CSI-RS based intra-frequency measurements

### 9.x.2.1 Introduction

A measurement is defined as a CSI-RS based intra-frequency measurement provided that:

* + - the SCS of CSI-RS resources on the neighbour cell configured for measurement is the same as the SCS of CSI-RS resources on the serving cell configured for measurement, and
    - the CP type of CSI-RS resources on neighbour cell configured for measurement is the same as the CP type of CSI-RS resources on the serving cell configured for measurement, and
  + It is applied for SCS = 60KHz
    - the centre frequency of CSI-RS resources on the neighbour cell configured for measurement is the same as the centre frequency of CSI-RS resource on the serving cell configured for measurement

The UE shall be able to identify new intra-frequency cells and perform CSI-RSRP, CSI-RSRQ and CSI-SINR measurements of identified intra-frequency cells if carrier frequency information is provided by PCell or the PSCell.

The UE can perform intra-frequency CSI-RS based measurements without measurement gaps if

- the CSI-RS resources are completely contained in the active BWP of the UE

For intra-frequency CSI-RS based measurements without measurement gaps, UE may cause scheduling restriction as specified in clause 9.x.2.5.

CSI-RS based measurements are configured along with a measurement timing configuration (CMTC) per carrier, which provides periodicity, duration and offset information on a window of up to 5ms where the measurements of CSI-RS on the configured intra-frequency carrier are to be performed. Up to two measurement window periodicity may be configured per intra-frequency measurement object.

### 9.x.2.2 Requirements applicability

The requirements in clause 9.x.2 apply, provided:

- All CSI-RS resources in the same MO are configured with the same csi-rs-MeasurementBW.

- The BW of the CSI-RS on the neighbor cell is within the active BWP of the UE

- The CSI-RS resources and the associated SSB of the cell being identified or measured are detectable.

An intra-frequency cell shall be considered detectable when for each relevant CSI-RS and associated SSB:

- CSI-RSRP related side conditions given in clauses 10.1 and 10.1 for FR1 and FR2, respectively, for a corresponding Band,

- CSI-RSRQ related side conditions given in clauses 10.1 and 10.1 for FR1 and FR2, respectively, for a corresponding Band,

- CSI-SINR related side conditions given in clauses 10.1 and 10.1 for FR1 and FR2, respectively, for a corresponding Band,

- CSI\_RP and CSI Ês/Iot according to Annex B.2.2 for a corresponding Band.

- SS-RSRP related side conditions given in clauses 10.1.2 and 10.1.3 for FR1 and FR2, respectively, for a corresponding Band,

- SS-RSRQ related side conditions given in clauses 10.1.7 and 10.1.8 for FR1 and FR2, respectively, for a corresponding Band,

- SS-SINR related side conditions given in clauses 10.1.12 and 10.1.13 for FR1 and FR2, respectively, for a corresponding Band,

- SSB\_RP and SSB Ês/Iot according to Annex B.2.2 for a corresponding Band.

### 9.x.3 Number of cells and number of CSI-RS

#### 9.x.3.1 Requirements for FR1

For each intra-frequency layer, during each layer 1 measurement period, the UE shall be capable of performing CSI-RSRP, CSI-RSRQ and CSI-SINR measurements for at least:

- 8 identified CSI-RS cells if configured, and

- 32 CSI-RS resources if configured on the intra-frequency layer,

#### 9.x.3.2 Requirements for FR2

For each intra-frequency layer, during each layer 1 measurement period, the UE shall be capable of performing CSI-RSRP, CSI-RSRQ and CSI-SINR measurements for at least:

- 6 identified CSI-RS cells if configured, and

- 32 CSI-RS resources if configured

where the single serving carrier shall be:

- PCC when UE is configured with SA NR operation mode with PCC in the band; or

- PSCC when UE is configured with EN-DC with PSCC in the band; or

- One of the SCCs on which UE is configured to report CSI-RS based measurements when neither PCC nor PSCC is in the same band, so that the selected SCC shall be an SCC where the UE is configured with CSI-RSRP measurement reporting if such SCC exists, otherwise the selected SCC is determined by UE implementation.

The UE shall also be capable of performing CSI-RSRP, CSI-RSRQ and CSI-SINR measurements for at least 2 CSI-RS resources if configured on serving cell for each of the other serving carrier(s) in the same band.

<< End of Change #1>>