**3GPP TSG-RAN4 Meeting #96-e *R4-*** ***20012174***

**Electronic meeting, 17 – 28 Aug., 2020**

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| *CR-Form-v11.2* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
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|  | **38.133** | **CR** | **1108** | **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 scheduling restriction for CSI-RS based intra-frequency measurement | | | | | | | | | |
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| ***Source to WG:*** | Qualcomm | | | | | | | | | |
| ***Source to TSG:*** | R4 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | NR\_CSIRS\_L3meas-Core | | | | |  | | ***Date:*** | | 2020-08-24 |
|  |  | | | |  | | |  | |  |
| ***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 to RAN4 in Rel-16. The CR aims to add restrictions in the scheduling availability during CSI-RS L3 intra-frequency measurements. The CR is revised from R4-2011416. | | | | | | | | |
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| ***Summary of change:*** | | Introduce the scheduling restriction for CSI-RS based intra-frequency measurement for RRM. | | | | | | | | |
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| ***Consequences if not approved:*** | | CSI-RS based UE measurement requirements are missing. | | | | | | | | |
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| ***Clauses affected:*** | | New section 9.x.2.x | | | | | | | | |
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|  | | **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.x.2.x Scheduling availability of UE during CSI-RS based intra-frequency measurements

UE shall be capable of measuring without measurement gaps when CSI-RS resources are completely contained in the active BWP of the UE [3]. Note the CSI-RS symbol to be measured is indicated in *firstOFDMSymbolInTimeDomain* included in *CSI-RS-ResourceConfigMobility* [2] for RRM. When any of the conditions in the following clauses is met, there are restrictions on the scheduling availability; otherwise, there is no scheduling restriction.

9.x.2.x.1 Scheduling availability of UE performing CSI-RS based measurements with simultaneous serving cell reception in FDD bands

*Editor’s note: following paragraph is pending on the agreement on Issue 2-1 tracked in [96e][224]NR\_CSIRS\_L3meas\_RRM\_1 on introducing a UE capability of whether UE can follow alternative cell timing for measuring CSI-RS resource for L3 and Issue 2-7-1 tracked in [96e][225]NR\_CSIRS\_L3meas\_RRM\_2. And* ***the capability can be mentioned below accordingly****.*

When the UE performs CSI-RS based intra-frequency measurements and the serving cell PDCCH/PDSCH reception simultaneously, the following restrictions apply which depends on whether UE supports employing an alternative cell timing based on one of configured associated SSBs other than the serving cell timing for measuring the CSI-RS resource.

* If UE follows the cell timing based on one of configured associated SSBs for the measurement, the UE is not expected to receive PDCCH/PDSCH/TRS on CSI-RS symbols to be measured and on 1 data symbol before each consecutive CSI-RS symbols to be measured and 1 data symbol after each consecutive CSI-RS symbols to be measured within the configured slot as indicated in *slotConfig* [2] of the corresponding CSI-RS resource.
* Otherwise, above restriction is not needed when UE following the serving cell timing for the measurement.

9.x.2.x.2 Scheduling availability of UE performing CSI-RS based measurements in TDD bands

*Editor’s note: the entire sub-section is pending on the agreement on Issue 2-7-2 tracked in [96e][225]NR\_CSIRS\_L3meas\_RRM\_2.*

When the UE performs CSI-RS based intra-frequency measurements in a TDD band, the following restrictions apply due to the UL and DL collision.

* The UE is not expected to transmit PUCCH/PUSCH/SRS on CSI-RS symbol to be measured and on 1 OFDM symbol before each CSI-RS symbol to be measured and 1 OFDM symbol after each CSI-RS symbol to be measured within the configured slot as indicated in *slotConfig* [2] of the corresponding CSI-RS resource.

9.x.2.x.3 Scheduling availability of UE performing CSI-RS based measurements with non-serving UE Rx beam in FR2

*Editor’s note: the entire sub-section is pending on the agreement on Issue 2-7-3 tracked in [96e][225]NR\_CSIRS\_L3meas\_RRM\_2.*

When the UE performs CSI-RS based intra-frequency measurements for L3 mobility management in FR2, if the associated SSB is configured and QCLed with the corresponding CSI-RS, UE may switch to an alternative Rx beam for measuring neighbor cells according to the associated SSB. The following restrictions apply.

* The UE is not expected to receive PDCCH/PDSCH/TRS on CSI-RS symbols to be measured and on 1 OFDM symbol before each CSI-RS symbol to be measured and 1 OFDM symbol after each CSI-RS symbol to be measured within the configured slot as indicated in *slotConfig* [2] of the corresponding CSI-RS resource.
* If the associated SSB is not configured or not QCLed, above restriction is not needed.

9.x.2.x.4 Scheduling availability of UE performing CSI-RS based measurements with simultaneous SSB based measurements

*Editor’s note: following paragraphs are pending on the agreement on Issue 2-5-1 tracked in [96e][225]NR\_CSIRS\_L3meas\_RRM\_2 to introduce a UE capability on the simultaneous reception of CSI-RS and SSB/Data and* ***the capability can be mentioned below accordingly****.*

When the UE performs CSI-RS based intra-frequency measurements for L3 mobility management, the following restrictions apply if the CSI-RS for L3 mobility shares the same OFDM symbol as the SSB signal.

* If the UE supports the simultaneous reception of CSI-RS of neighbour cell and an SSB, the UE shall be able to perform SSB based measurement and CSI-RS based measurement for L3 mobility without restrictions.
* If the UE does not support the simultaneous reception of CSI-RS of neighbour cell and an SSB, UE is not expected to receive CSI-RS for L3 mobility in the OFDM symbol that overlaps with an SSB.

<End of Change 1>