**3GPP TSG-RAN4 Meeting #112 *R4-241xxxx***

**Maastricht, The Netherlands, 19 – 23 August, 2024**

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| *CR-Form-v12.3* |
| **CHANGE REQUEST** |
|  |
|  | **38.133** | **CR** | **4802** | **rev** | **1** | **Current version:** | **18.6.0** |  |
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| *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 core requirements maintenance for R18 ATG |
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| ***Source to WG:*** | Huawei, HiSilicon |
| ***Source to TSG:*** | R4 |
|  |  |
| ***Work item code:*** | NR\_ATG-Core |  | ***Date:*** | 2024-08-08 |
|  |  |  |  |  |
| ***Category:*** | **F** |  | ***Release:*** | Rel-18 |
|  | *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 canbe 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-17 (Release 17)Rel-18 (Release 18)Rel-19 (Release 19) Rel-20 (Release 20)* |
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| ***Reason for change:*** | Based on the ATG requirements, inter-RAT scenarios are not included in the measurement process. |
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| ***Summary of change:*** | The changes are in following part:1. Correct the requirement for SSB based L1-RSRP Reporting.
2. Correct the requirement for L1-SINR reporting with CSI-RS based CMR and no dedicated IMR configured.
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| ***Consequences if not approved:*** | The ATG L1-reporting related requirements are not correct. |
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| ***Clauses affected:*** | 9.5D.4.1, 9.8D.4.1 |
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|  | **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:*** |  |
|  |  |
| ***This CR's revision history:*** |  |

### <Start of Change 1>

### 9.5D.4 L1-RSRP measurement requirements

#### 9.5D.4.1 SSB based L1-RSRP Reporting

The UE shall be capable of performing L1-RSRP measurements based on the configured SSB resource for L1-RSRP computation, and the UE physical layer shall be capable of reporting L1-RSRP measured over the measurement period of TL1-RSRP\_Measurement\_Period\_SSB\_ATG.

The value of TL1-RSRP\_Measurement\_Period\_SSB\_ATG is defined in Table 9.5D.4.1-1 for FR1, where

- M=1 if higher layer parameter *timeRestrictionForChannelMeasurement* is configured, and M=3 otherwise

For ATG UE with the antenna array,

P value for SSB resource to be measured is defined as

- Ntotal / Navailable with Navailable > 0

- Psharing factor \* Ntotal / Noutside\_MG with Navailable = 0

- For a window W of duration max(TL1, MGRP\_max), where MGRP\_max is the maximum MGRP across all configured per-UE measurement gaps, and starting at the beginning of any SSB resource occasion:

- Ntotal is the total number of SSB resource occasions within the window W, including those overlapped with measurement gap occasions or SMTC occasions within the window W, and

- Noutside\_MG is the number of SSB resource occasions that are not overlapped with any measurement gap occasion within the window W

- Navailable is the number of SSB resource occasions that are not overlapped with any measurement gap occasion nor any SMTC occasion within the window W

- TL1 is periodicity of the target SSB

- Psharing factor = 3.

Otherwise, for UE with one or multiple omni-directional antennas

For a UE supporting *concurrentMeasGap-r17* and when concurrent gaps are configured,

- P value for SSB resource to be measured is defined as

- Ntotal / Noutside\_MG

- For a window W of duration max(TL1, MGRP\_max), where MGRP\_max is the maximum MGRP across all configured per-UE measurement gaps, and starting at the beginning of any SSB resource occasion:

- Ntotal is the total number of SSB resource occasions within the window W, including those overlapped with measurement gap occasions or SMTC occasions within the window W, and

- Noutside\_MG is the number of SSB resource occasions that are not overlapped with any measurement gap occasion within the window W

- TL1 is periodicity of the target SSB.

Otherwise, for a UE not supporting *concurrentMeasGap-r17* or when concurrent gaps are not configured,

- P=$\frac{1}{1-\frac{T\_{SSB}}{xGP}}$, when in the monitored cell there are GAPs configured for intra-frequency or inter-frequency, which are overlapping with some but not all occasions of the SSB; and

- P=1 when in the monitored cell there are no GAPs overlapping with any occasion of the SSB.

Where:

- TSSB = ssb-periodicityServingCell of the serving cell

- an SSB or an SMTC occasion is considered to be overlapped with the GAP if it overlaps a measurement gap occasion, and

- xRP = MGRP

If the high layer in TS 38.331 [2] signaling of *smtc2* is configured, TSMTCperiod corresponds to the value of higher layer parameter *smtc2*; Otherwise TSMTCperiod corresponds to the value of higher layer parameter *smtc1*.

Longer evaluation period would be expected if the combination of SSB, SMTC occasion and GAP configurations does not meet previous conditions.

### <End of Change 1>

### <Start of Change 2>

#### 9.8D.4.1 9.8D.4.1 L1-SINR reporting with CSI-RS based CMR and no dedicated IMR configured

The UE shall be capable of performing L1-SINR measurements with the CSI-RS configured as CMR and no dedicated resource configured as IMR for L1-SINR computation, and the UE physical layer shall be capable of reporting L1-SINR measured over the measurement period of TL1-SINR\_Measurement\_Period\_CSI-RS\_CMR\_Only\_ATG.

The value of TL1-SINR\_Measurement\_Period\_CSI-RS\_CMR\_Only\_ATG is defined in Table 9.8D.4.1-1 for FR1, where

For the value of M,

- For periodic and semi-persistent CSI-RS resources as CMR, M=1 if higher layer parameter *timeRestrictionForChannelMeasurement* is configured, and M=3 otherwise;

- For aperiodic CSI-RS resources as CMR, M=1.

For ATG UE with the antenna array,

P value for a CSI-RS resource to be measured is defined as

- Ntotal / Navailable with Navailable > 0

- Psharing factor \* Ntotal / Noutside\_MG with Navailable = 0

- For a window W of duration max(TL1, MGRP\_max), where MGRP\_max is the maximum MGRP across all configured per-UE measurement gaps, and starting at the beginning of any CSI-RS resource occasion:

- Ntotal is the total number of CSI-RS resource occasions within the window W, including those overlapped with measurement gap occasions or SMTC occasions within the window W, and

- Noutside\_MG is the number of CSI-RS resource occasions that are not overlapped with any measurement gap occasion within the window W

- Navailable is the number of CSI-RS resource occasions that are not overlapped with any measurement gap occasion nor any SMTC occasion within the window W

- TL1 is periodicity of the target CSI-RS

- Psharing factor = 3.

Otherwise, for UE with one or multiple omni-directional antenna(s)

For a UE supporting *concurrentMeasGap-r17* and when concurrent gaps are configured,

- P value for a CSI-RS resource to be measured is defined as

- Ntotal / Noutside\_MG

- For a window W of duration max(TL1, MGRP\_max), where MGRP\_max is the maximum MGRP across all configured per-UE measurement gaps, and starting at the beginning of any CSI-RS resource occasion:

- Ntotal is the total number of CSI-RS resource occasions within the window W, including those overlapped with measurement gap occasions or SMTC occasions within the window W, and

- Noutside\_MG is the number of CSI-RS resource occasions that are not overlapped with any measurement gap occasion within the window W

- TL1 is periodicity of the target CSI-RS.

Otherwise, for a UE not supporting *concurrentMeasGap-r17* or when concurrent gaps are not configured,

- P=$\frac{1}{1-\frac{T\_{CSI-RS}}{xGP}}$, when in the monitored cell there are [measurement gaps] configured for intra-frequency or inter-frequency, which are overlapping with some but not all occasions of the CSI-RS; and

- P=1 when in the monitored cell there are no GAPs overlapping with any occasion of the CSI-RS.

Where:

- TCSI-RS = the periodicity of CSI-RS configured for L1-SINR measurement

- a CSI-RS is considered to be overlapped with the GAP if it overlaps a measurement gap occasion, and

- xRP = MGRP

If the high layer in TS 38.331 [2] signaling of *smtc2* is configured, TSMTCperiod corresponds to the value of higher layer parameter *smtc2*; Otherwise TSMTCperiod corresponds to the value of higher layer parameter *smtc1*.

Note: The overlap between CSI-RS for L1-SINR measurement and SMTC means that CSI-RS for L1-SINR measurement is within the SMTC window duration.

Longer evaluation period would be expected if the combination of CSI-RS, SMTC occasion and GAP configurations does not meet previous conditions.

### <End of Change 2>