**3GPP TSG- Meeting #**

**, , -**

|  |
| --- |
| *CR-Form-v12.3* |
| **CHANGE REQUEST** |
|  |
|  |  | **CR** |  | **rev** |  | **Current version:** |  |  |
|  |
| *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)*.* |
|  |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ***Proposed change affects:*** | UICC apps |  | ME | **X** | Radio Access Network |  | Core Network |  |

|  |
| --- |
|  |
| ***Title:***  | (NR\_newRAT-Perf) CR to Rel-15 38.101-4 Frequency domain granularity of random PMI for PMI requirements |
|  |  |
| ***Source to WG:*** |  |
| ***Source to TSG:*** |  |
|  |  |
| ***Work item code:*** |  |  | ***Date:*** |  |
|  |  |  |  |  |
| ***Category:*** |  |  | ***Release:*** |  |
|  | *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)* |
|  |  |
| ***Reason for change:*** | Explicitly define frequency domain granularity of random PMI in CSI PMI requirements where undefined. |
|  |  |
| ***Summary of change:*** | Modify existing test• Modify FR2 2RX TDD Chapter 8.3.2.2.1 |
|  |  |
| ***Consequences if not approved:*** | The PMI requirements of may be ambiguous without explicit definition of random PMI frequency domain granularity in all tests. |
|  |  |
| ***Clauses affected:*** | 8.3.2.2.1 |
|  |  |
|  | **Y** | **N** |  |  |
| ***Other specs*** |  | **X** |  Other core specifications  | TS/TR ... CR ...  |
| ***affected:*** | **X** |  |  Test specifications | TS38.521-4 |
| ***(show related CRs)*** |  | **X** |  O&M Specifications | TS/TR ... CR ...  |
|  |  |
| ***Other comments:*** |  |
|  |  |
| ***This CR's revision history:*** | Revision of R4-2412326 |

**START OF CHANGE 1**

##### 8.3.2.2.1 Single PMI with 2TX TypeI-SinglePanel Codebook

For the parameters specified in Table 8.3.2.2.1-1, and using the downlink physical channels specified in Annex C.5.1, the minimum requirements are specified in Table 8.3.2.2.1-2.

Table 8.3.2.2.1-1: Test parameters (single layer)

|  |  |  |  |
| --- | --- | --- | --- |
| **Parameter** | **Unit** | **Test 1** | **Test 2** |
| Bandwidth | MHz | 100 | 100 |
| Subcarrier spacing | kHz | 120 | 120 |
| TDD DL-UL configuration |  | FR2.120-2 as specified in Annex A.1.3 | FR2.120-1 as specified in Annex A.1.3 |
| Propagation channel |  | TDLA30-35 | TDLA30-35 |
| Antenna configuration |  | 2 x 2 ULA Low | 2 x 2 ULA Low |
| Beamforming Model |  | As specified in Annex B.4.1 | As specified in Annex B.4.1 |
| ZP CSI-RS configuration | CSI-RS resource Type |  | Periodic | Periodic |
| Number of CSI-RS ports (*X*) |  | 4 | 4 |
| CDM Type |  | FD-CDM2 | FD-CDM2 |
| Density (ρ) |  | 1 | 1 |
| First subcarrier index in the PRB used for CSI-RS (k0, k1 ) |  | Row 4, (8,-) | Row 4, (8,-) |
| First OFDM symbol in the PRB used for CSI-RS (l0, l1) |  | (13,-) | (13,-) |
| CSI-RSperiodicity and offset | slot | 8/1 | 5/1 |
| NZP CSI-RS for CSI acquisition | CSI-RS resource Type |  | Aperiodic | Aperiodic |
| Number of CSI-RS ports (*X*) |  | 2 | 2 |
| CDM Type |  | FD-CDM2 | FD-CDM2 |
| Density (ρ) |  | 1 | 1 |
| First subcarrier index in the PRB used for CSI-RS (k0, k1 ) |  | Row 3, (6,-) | Row 3, (6,-) |
| First OFDM symbol in the PRB used for CSI-RS (l0, l1) |  | (13,-) | (13,-) |
| CSI-RSperiodicity and offset | slot | Not configured | Not configured |
| aperiodicTriggeringOffset |  | 0 | 0 |
| CSI-IM configuration | CSI-IM resource Type |  | Aperiodic | Aperiodic |
| CSI-IM RE pattern |  | Pattern 1 | Pattern 1 |
| CSI-IM Resource Mapping(kCSI-IM,lCSI-IM) |  | (8,13) | (8,13) |
| CSI-IM timeConfigperiodicity and offset | slot | Not configured | Not configured |
| ReportConfigType |  | Aperiodic | Aperiodic |
| CQI-table |  | Table 1 | Table 1 |
| reportQuantity |  | cri-RI-PMI-CQI | cri-RI-PMI-CQI |
| timeRestrictionForChannelMeasurements |  | Not configured | Not configured |
| timeRestrictionForInterferenceMeasurements |  | Not configured | Not configured |
| cqi-FormatIndicator |  | Wideband | Wideband |
| pmi-FormatIndicator |  | Wideband | Wideband |
| Sub-band Size | RB | 8 | 8 |
| csi-ReportingBand |  | 111111111 | 111111111 |
| CSI-Report periodicity and offset | slot | Not configured | Not configured |
| Aperiodic Report Slot Offset |  | 6 | 8 |
| CSI request |  | 1 in slots i, where mod(i, 8) = 1, otherwise it is equal to 0 | 1 in slots i, where mod(i, 5) = 1, otherwise it is equal to 0 |
| reportTriggerSize |  | 1 | 1 |
| CSI-AperiodicTriggerStateList |  | One State with one Associated Report ConfigurationAssociated Report Configuration contains pointers to NZP CSI-RS and CSI-IM | One State with one Associated Report ConfigurationAssociated Report Configuration contains pointers to NZP CSI-RS and CSI-IM |
| Codebook configuration | Codebook Type |  | typeI-SinglePanel | typeI-SinglePanel |
| Codebook Mode |  | 1 | 1 |
| (CodebookConfig-N1,CodebookConfig-N2) |  | N/A | N/A |
| CodebookSubsetRestriction |  | 001111 | 001111 |
| RI Restriction |  | N/A | N/A |
| Physical channel for CSI report |  | PUSCH | PUSCH |
| CQI/RI/PMI delay  | ms | 1.375 | 1.75 |
| Maximum number of HARQ transmission |  | 4 | 4 |
| Measurement channel |  | R.PDSCH.5-8.1 TDD | R.PDSCH.5-7.1 TDD |
| PDSCH & PDSCH DMRS Precoding configuration for random Precoding |  | Single Panel Type I, Random precoder selection updated per slot, with equal probability of each applicable codebook index, chosen from section 5.2.2.2.1 of TS 38.214 [12], and with Wideband granularity |
| Note 1: For random precoder selection, the precoder shall be updated in each slot (0.125 ms granularity).Note 2: If the UE reports in an available uplink reporting instance at slot#n based on PMI estimation at a downlink slot not later than slot#(n-4)], this reported PMI cannot be applied at the gNB downlink before slot#(n+4)].Note 3: Randomization of the principle beam direction shall be used as specified in Annex B.2.3.2.3. |

**END OF CHANGE 1**