**3GPP TSG- Meeting #R1-240nnnn**

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| *CR-Form-v12.3* |
| **CHANGE REQUEST** |
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|  |  | **CR** | **---** | **rev** |  | **Current version:** |  |  |
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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 | **X** | Core Network |  |

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| ***Title:***  | Alignments on RRC parameters for NR Rel-18 MIMO in TS 38.214 |
|  |  |
| ***Source to WG:*** | Moderator (MediaTek. Inc), CATT, Ericsson, Samsung |
| ***Source to TSG:*** | --- |
|  |  |
| ***Work item code:*** |  |  | ***Date:*** |  |
|  |  |  |  |  |
| ***Category:*** | **D** |  | ***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)* |
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| ***Reason for change:*** | The following higher layer parameters in TS38.214 are not align with those in TS38.331/TS38.306/TS38.212* [applyIndicatedTCIState]
* [two default beams for S-DCI based MTRP]
* [support for two joint TCI states for PDSCH-CJT]
* applyIndicatedTCIState
* cjtSchemePDSCH
* [TCI selection field]
* [[followUnifiedTCI-StateSRS]]
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| ***Summary of change:*** | Update above parameters in the sections of TS38.214 to align with those in TS38.331/TS38.306/TS38.212 |
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| ***Consequences if not approved:*** | Higher-layer parameter misalignment between TS38.214 and TS38.331/TS38.306/TS38.212 |
|  |  |
| ***Clauses affected:*** | 5.4 |
|  |  |
|  | **Y** | **N** |  |  |
| ***Other specs*** |  | **N** |  Other core specifications  | TS/TR ... CR ...  |
| ***affected:*** |  | **N** |  Test specifications | TS/TR ... CR ...  |
| ***(show related CRs)*** |  | **N** |  O&M Specifications | TS/TR ... CR ...  |
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| ***Other comments:*** |  |
|  |  |
| ***This CR's revision history:*** |  |

5.1 UE procedure for receiving the physical downlink shared channel

-------------------------------------------Unchanged parts are omitted-------------------------------------------

When a UE is configured with both *sfnSchemePDSCH* and *sfnSchemePDCCH*, the UE shall expect that *sfnSchemePDSCH* and *sfnSchemePDCCH* are set to the same scheme, either *'*sfnSchemeA*'* or *'*sfnSchemeB*'*.

If a UE not configured with *dl-OrJointTCI-StateList* is configured with *sfnSchemePDCCH* set to 'sfnSchemeA' and activated with two TCI states by MAC CE, and the UE does not report its capability of *sfn-SchemeA-PDCCH-only*, the UE is expected to be configured with *sfnSchemePDSCH* set to *'sfnSchemeA'* and indicated with two TCI states in a codepoint of the DCI field *'Transmission Configuration Indication',* if the PDSCH is scheduled by DCI format 1\_1/1\_2.

If a UE configured with *dl-OrJointTCI-StateList* and having two indicated TCI-States is configured with *sfnSchemePdcch* set to 'sfnSchemeA' for a DL BWP and signaled by the higher layer parameter ~~[applyIndicatedTCIState]~~ *applyIndicatedTCI-State* to apply both indicated TCI-States to a PDCCH on a CORESET, and the UE does not report its capability of *sfn-SchemeA-PDCCH-only*, the UE is expected to be configured with *sfnSchemePdsch* set to *'sfnSchemeA'* and both indicated TCI-States are applicable to PDSCH, if the PDSCH is scheduled by DCI format 1\_1/1\_2 on the PDCCH.

If a UE not configured with *dl-OrJointTCI-StateList* is configured with *sfnSchemePDCCH* set to 'sfnSchemeB' and activated with two TCI states by MAC CE, the UE is expected to be configured with *sfnSchemePDSCH* set to *'sfnSchemeB'* and indicated with two TCI states in a codepoint of the DCI field *'Transmission Configuration Indication',* if the PDSCH is scheduled by DCI format 1\_1/1\_2.

If a UE configured with *dl-OrJointTCI-StateList* and having two indicated TCI-States is configured with *sfnSchemePdcch* set to 'sfnSchemeB' for a DL BWP, and signaled by the higher layer parameter ~~[~~~~applyIndicatedTCIState]~~ *applyIndicatedTCI-State* to apply both indicated TCI-States to a PDCCH on a CORESET, the UE is expected to be configured with *sfnSchemePdsch* set to *'sfnSchemeB'* and both indicated TCI-States are applicable to PDSCH*,* if the PDSCH is scheduled by DCI format 1\_1/1\_2 on the PDCCH.

-------------------------------------------Unchanged parts are omitted-------------------------------------------

5.1.5 Antenna ports quasi co-location

-------------------------------------------Unchanged parts are omitted-------------------------------------------

When a UE is configured by higher layer parameter *cjtSchemePDSCH* and *dl-OrJointTCI-StateList* and is indicated with two TCI-States applied for PDSCH reception and reports ~~[~~~~support for two joint TCI states for PDSCH-CJT]~~ *twoTCI-StatePDSCH-CJT-TxScheme*:

- if the UE is configured with *cjtSchemeA*, the UE assumes that PDSCH DM-RS port(s) are QCLed with the DL RSs of both indicated TCI-States with respect to QCL-TypeA.

- if the UE is configured with *cjtSchemeB*, the UE assumes that PDSCH DM-RS port(s) are QCLed with the DL RSs of both indicated TCI-States with respect to QCL-TypeA except for QCL parameters {Doppler shift, Doppler spread} of the second indicated joint TCI state.

-------------------------------------------Unchanged parts are omitted-------------------------------------------

When a UE is configured with *dl-OrJointTCI-StateList* and is having two indicated TCI-States:

- Regardless of the offset between the reception of the scheduling DCI format 1\_0/1\_1/1\_2 and the scheduled/activated PDSCH reception, if the UE is in frequency range 1, or the UE reports its capability of *~~[two default beams for S-DCI based MTRP]~~* *defaultQCL-TwoTCI* in frequency range 2, or

- If the UE does not report its capability of *~~[two default beams for S-DCI based MTRP]~~ defaultQCL-TwoTCI* in frequency range 2 and if the scheduling offset between the reception of the scheduling DCI format 1\_0/1\_1/1\_2 and the scheduled/activated PDSCH reception is equal to or larger than ~~[~~*timeDurationForQCL~~]~~*

- The UE can be configured by higher layer parameter *~~applyIndicatedTCIState~~* *applyIndicatedTCI-StateDCI-1-0* to indicate whether the first, the second, or both of the indicated TCI-State(s) is/are applied to PDSCH reception scheduled or activated by DCI format 1\_0. The UE can be configured with *~~applyIndicatedTCIState~~* *applyIndicatedTCI-StateDCI-1-0* with value *both* only when the UE is configured with *~~cjtSchemePDSCH~~* *cjt-Scheme-PDSCH* and the UE reports ~~[~~*~~support for two joint TCI states for PDSCH-CJT~~*~~]~~ *twoTCI-StatePDSCH-CJT-TxScheme* or the UE is configured with *sfnSchemePdsch*. In that case, the UE shall apply both indicated TCI-States to PDSCH reception scheduled or activated by DCI format 1\_0 on a search space other than Type0/0A/2 CSS on CORESET#0.

- If the UE is not configured with *~~applyIndicatedTCIState~~* *applyIndicatedTCI-StateDCI-1-0*, the first indicated TCI-States is applied to PDSCH reception scheduled or activated by DCI format 1\_0.

- When the UE is configured with *tciSelection-PresentInDCI* jointly for both DCI formats 1\_1 and 1\_2 in the same DL BWP,and when the UE receives a DCI format 1\_1/1\_2 that schedules or activates PDSCH reception, the UE shall determine the indicated joint/DL TCI state(s) for the PDSCH reception according to the following:

- If the DCI format 1\_1/1\_2 indicates codepoint "00" for the ~~[~~TCI selection field~~]~~, the UE shall apply the first one of two indicated joint/DL TCI states to all PDSCH DM-RS port(s) of corresponding PDSCH transmission occasion(s) scheduled or activated by the DCI format 1\_1/1\_2.

- If the DCI format 1\_1/1\_2 indicates codepoint "01" for the ~~[~~TCI selection field~~]~~, the UE shall apply the second one of two indicated joint/DL TCI states to all PDSCH DM-RS port(s) of corresponding PDSCH transmission occasion(s) scheduled or activated by the DCI format 1\_1/1\_2.

- If the DCI format 1\_1/1\_2 indicates codepoint "10" for the ~~[~~TCI selection field~~]~~, the UE shall apply both indicated joint/DL TCI states to the PDSCH reception scheduled or activated by the DCI format 1\_1/1\_2.

- If the UE is not configured with *tciSelection-PresentInDCI* and when the UE receives a DCI format 1\_1/1\_2 that schedules/activates PDSCH reception, the UE shall apply both indicated TCI-Statesto the scheduled or activated PDSCH reception

-------------------------------------------Unchanged parts are omitted-------------------------------------------

6.1 UE procedure for transmitting the physical uplink shared channel

-------------------------------------------Unchanged parts are omitted-------------------------------------------

When a UE is configured with *dl-OrJointTCI-StateList* or *TCI-UL-State* and is having two indicated TCI-States or TCI-UL-States,

- a UE having a PUSCH transmission scheduled or activated by DCI format 0\_0 should apply the first indicated TCI state to the PUSCH transmission,

- a UE configured with a PUSCH transmission corresponding to a Type 1 configured grant is expected to be configured with the higher layer parameter *~~applyIndicatedTCIState~~* *applyIndicatedTCI-State* indicating the *first*, the *second* or *both* of the indicated TCI states to be applied for the PUSCH transmission. If 'both' TCI states are indicated, the UE should apply the first indicated TCI state to the PUSCH transmission occasion(s) or the PUSCH antenna port(s) associated with the first SRS resource set for CB/NCB transmission, and the second indicated TCI state to the PUSCH transmission occasion(s) or the PUSCH antenna port(s) associated with the second SRS resource set for CB/NCB transmission; otherwise the UE should apply either the 'first' or 'second' indicated TCI state to all PUSCH transmission occasions.

- If the UE is configured by higher layer parameter *PDCCH-Config* that contains two different values of *coresetPoolIndex* in different *ControlResourceSets*, the first and the second indicated TCI states correspond to the indicated TCI-States or TCI-UL-States specific to coresetPoolIndex value 0 and value 1, respectively, and *~~applyIndicatedTCIState~~* *applyIndicatedTCI-State* does not indicate *both* of the indicated TCI states to be applied for the PUSCH transmission

-------------------------------------------Unchanged parts are omitted-------------------------------------------

When a UE is configured with *dl-OrJointTCI-StateList* or *TCI-UL-State* is having two indicated TCI states, and only one SRS resource set is configured in *srs-ResourceSetToAddModList* or *srs-ResourceSetToAddModListDCI-0-2* with higher layer parameter *usage* in *SRS-ResourceSet* set to 'codebook' or 'noncodebook', the PUSCH transmission occasion(s) scheduled or activated by DCI format 0\_1 or 0\_2 is associated with the first indicated *TCI-States* or *TCI-UL-States* if applies or is associated with the second indicated *TCI-States* or *TCI-UL-States* if applies, as indicated by the higher layer parameter*~~applyIndicatedTCIState-r18~~ applyIndicatedTCI-State* configured by *PUSCH-Config.*

-------------------------------------------Unchanged parts are omitted-------------------------------------------

6.2.1 UE sounding procedure

-------------------------------------------Unchanged parts are omitted-------------------------------------------

When the UE is configured *dl-OrJointTCI-StateList* or *TCI-UL-State* and is having two indicated TCI-States or TCI-UL-States, and if the UE is configured with ~~[[~~*followUnifiedTCI-StateSRS~~]]~~* to*,* a periodic, semi-persistent or aperiodic SRS resource set with higher layer parameter *usage* in *SRS-ResourceSet* set to '*codebook*', '*nonCodebook*' or '*antennaSwitching*' or to an aperiodic SRS resource set with higher layer parameter *usage* in *SRS-ResourceSet* set to '*beamManagement*'

- The UE may be configured by higher layer parameter *~~applyIndicatedTCIState~~* *applyIndicatedTCI-State* to the SRS resource set to indicate whether the UE shall apply the first or the second indicated *TCI-State* or *TCI-UL-State* to the SRS resource set.

- When a UE is configured by higher layer parameter *PDCCH-Config* that contains two different values of *coresetPoolIndex* in *ControlResourceSet*, the first and second indicated *TCI-States* or *TCI-UL-States* correspond to the indicated *TCI-States* or *TCI-UL-States* specific to *coresetPoolIndex* value 0 and value 1, respectively.

- When a UE is configured by higher layer parameter *PDCCH-Config* that contains two different values of *coresetPoolIndex* in *ControlResourceSet*, and the aperiodic SRS resource set which is not configured with higher layer parameter *~~applyIndicatedTCIState~~ applyIndicatedTCI-State* and the aperiodic SRS resource set is triggered by PDCCH on a CORESET associated with a *coresetPoolIndex* value, the UE shall apply the indicated *TCI-State* or *TCI-UL-State* specific to the *coresetPoolIndex* value to the aperiodic SRS resource set.

- When two SRS resource sets with higher layer parameter *usage* in *SRS-ResourceSet* set to 'codebook' or 'nonCodebook' are configured, the UE does not expect that the first indicated *TCI-State* or *TCI-UL-State* is applied to the second SRS resource set and that the second indicated *TCI-State* or *TCI-UL-State* is applied to the first SRS resource set.

-------------------------------------------Unchanged parts are omitted-------------------------------------------