**3GPP TSG-RAN WG1 Meeting #117 *R1-240xxxx***

**Fukuoka, Japan, May 20th – 24th, 2024**

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| *CR-Form-v12.3* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **38.214** | **CR** | **xxxx** | **rev** | **-** | **Current version:** | **17.9.0** |  |
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| *For* ***[HE](http://www.3gpp.org/3G_Specs/CRs.htm" \l "_blank)******[LP](http://www.3gpp.org/3G_Specs/CRs.htm" \l "_blank)*** *on using this form: comprehensive instructions can be found at*  *<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:*** | Draft CR on UL TX spatial filter determination | | | | | | | | | |
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| ***Source to WG:*** | Moderator(CATT) | | | | | | | | | |
| ***Source to TSG:*** | R1 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | NR FeMIMO-Core | | | | |  | ***Date:*** | | | 2024-5-22 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | F |  | | | | | ***Release:*** | | | Rel-17 |
|  | *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-17 (Release 17)*  *Rel-18 (Release 18)*  *Rel-19 (Release 19)*  *Rel-20 (Release 20)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | In Rel-17 unified TCI framework, it was agreed that the UL TX spatial filter for an UL transmission associated with a joint TCI state is derived from the RS with qcl-Type set to 'typeD' of the joint TCI state. However, how to determine the UL TX spatial filter for SRS resource(s) configured with a joint TCI state is not specified in TS38.214. | | | | | | | | |
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| ***Summary of change:*** | | Clarify that the UL TX spatial filter for PUCCH, PUSCH, and SRS configured/indicated with a joint TCI state is derived from the RS with qcl-Type set to 'typeD' of the joint TCI state. | | | | | | | | |
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| ***Consequences if not approved:*** | | UE behavior on how to determine the UL TX spatial filter for SRS resource(s) configured with a joint TCI state is unclear. | | | | | | | | |
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| ***Clauses affected:*** | | 5.1.5 | | | | | | | | |
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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:*** | | Isolated impact analysis:  The change is aligned with previous RAN1 agreement on the determination of UL Tx spatial filter. It is expected that UEs and networks are implemented with the same understanding and therefore no change is required on UE and network implementation. | | | | | | | | |
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| ***This CR's revision history:*** | |  | | | | | | | | |

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### 5.1.5 Antenna ports quasi co-location

The UE can be configured with a list of up to *M* *TCI-State* configurations within the higher layer parameter *PDSCH-Config* to decode PDSCH according to a detected PDCCH with DCI intended for the UE and the given serving cell, where M depends on the UE capability *maxNumberConfiguredTCIstatesPerCC*. Each *TCI-State* contains parameters for configuring a quasi co-location relationship between one or two downlink reference signals and the DM-RS ports of the PDSCH, the DM-RS port of PDCCH or the CSI-RS port(s) of a CSI-RS resource. The quasi co-location relationship is configured by the higher layer parameter *qcl-Type1* for the first DL RS, and *qcl-Type2* for the second DL RS(if configured). For the case of two DL RSs, the QCL types shall not be the same, regardless of whether the references are to the same DL RS or different DL RSs. The quasi co-location types corresponding to each DL RS are given by the higher layer parameter *qcl-Type* in *QCL-Info* and may take one of the following values:

- 'typeA': {Doppler shift, Doppler spread, average delay, delay spread}

- 'typeB': {Doppler shift, Doppler spread}

- 'typeC': {Doppler shift, average delay}

- 'typeD': {Spatial Rx parameter}

The UE can be configured with a list of up to *128* *TCI-State* configurations, within the higher layer parameter *dl-OrJointTCI-StateList* in *PDSCH-Config* for providing a reference signal for the quasi co-location for DM-RS of PDSCH and DM-RS of PDCCH in a BWP/CC, for CSI-RS, and to provide a reference signal with *qcl-Type* set to 'typeD', if applicable, for determining UL TX spatial filter for dynamic-grant and configured-grant based PUSCH and PUCCH resource in a BWP/CC, and SRS.

<Unrelated parts are omitted>