**3GPP TSG-RAN WG1 Meeting #104 bis-e R1-2xxxxx**

**E-meeting, April 12th – 20th, 2021**

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| *CR-Form-v11.4* | | | | | | | | |
| **[DRAFT] CHANGE REQUEST** | | | | | | | | |
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|  | **38.211** | **CR** | **-** | **rev** | **-** | **Current version:** | **16.5.0** |  |
|  | | | | | | | | |
| *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 | **x** | Core Network |  |

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| ***Title:*** | Draft CR for 38.211 | | | | | | | | | |
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| ***Source to WG:*** | Moderator (Apple Inc), Huawei, HiSilicon | | | | | | | | | |
| ***Source to TSG:*** | R1 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | NR\_eMIMO-Core | | | | |  | | ***Date:*** | | 2020-04-06 |
|  |  | | | |  | | |  | |  |
| ***Category:*** | **F** |  | | | | | | ***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)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | There is a typo in the formula of the intermediate quanlity mapping to physical resources for PUSCH DMRS in sub-section 6.4.1.1.3 in TS 38.211. The range of the j in the intermediate quanlity of PUSCH DMRS should be 0 to ν-1, but not be 0 to p-1. | | | | | | | | |
| ***T*** | |  | | | | | | | | |
| ***Summary of change:*** | | To correct the maximum value of the j from ρ-1 to ν-1 for the intermediate quanlity in the formulation of DMRS port mapping in 6.4.1.1.3 of TS 38.211. | | | | | | | | |
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| ***Consequences if not approved:*** | | It may lead to a wrong mapping from the intermediate quanlity to physical resources when ρ≠ν. | | | | | | | | |
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| ***Clauses affected:*** | | 6.4.1.1.3 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **Y** | **N** |  | | |  | | | |
| ***Other specs*** | |  | **X** | Other core specifications | | |  | | | |
| ***affected:*** | |  | **X** | Test specifications | | |  | | | |
| ***(show related CRs)*** | |  | **X** | O&M Specifications | | |  | | | |
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| ***Other comments:*** | | The change is the common understanding on the mapping between PUSCH ports and UL DMRS ports for the precoding, there is no impact on the current implementation. | | | | | | | | |

##### 6.4.1.1.3 Precoding and mapping to physical resources

#### < Unchanged parts are omitted >

The sequence  shall be mapped to the intermediate quantity according to

- if transform precoding is not enabled,



- if transform precoding is enabled



where , , and are given by Tables 6.4.1.1.3-1 and 6.4.1.1.3-2 and the configuration type is given by the higher-layer parameter *DMRS-UplinkConfig*, and both and correspond to . The intermediate quantity if Δ corresponds to any other antenna ports than*.*

The intermediate quantity shall be precoded, multiplied with the amplitude scaling factor  in order to conform to the transmit power specified in [6, TS 38.214], and mapped to physical resources according to

where

- the precoding matrix is given by clause 6.3.1.5,

- the set of antenna ports  is given by clause 6.3.1.5, and

- the set of antenna ports  is given by [6, TS 38.214];

and the following conditions are fulfilled:

- the resource elements are within the common resource blocks allocated for PUSCH transmission.

The reference point for is

- subcarrier 0 in common resource block 0 if transform precoding is not enabled, and

- subcarrier 0 of the lowest-numbered resource block of the scheduled PUSCH allocation if transform precoding is enabled.

The reference point for and the position  of the first DM-RS symbol depends on the mapping type:

- for PUSCH mapping type A:

-  is defined relative to the start of the slot if frequency hopping is disabled and relative to the start of each hop in case frequency hopping is enabled

-  is given by the higher-layer parameter *dmrs-TypeA-Position*

- for PUSCH mapping type B:

-  is defined relative to the start of the scheduled PUSCH resources if frequency hopping is disabled and relative to the start of each hop in case frequency hopping is enabled

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The position(s) of the DM-RS symbols is given by  and duration where

- is the duration between the first OFDM symbol of the slot and the last OFDM symbol of the scheduled PUSCH resources in the slot for PUSCH mapping type A according to Tables 6.4.1.1.3-3 and 6.4.1.1.3-4 if intra-slot frequency hopping is not used, or

- is the duration of scheduled PUSCH resources for PUSCH mapping type B according to Tables 6.4.1.1.3-3 and 6.4.1.1.3-4 if intra-slot frequency hopping is not used, or

- is the duration per hop according to Table 6.4.1.1.3-6 if intra-slot frequency hopping is used.

- if the higher-layer parameter *maxLength* in *DMRS-UplinkConfig* is not configured, or for a msgA transmission *msgA-MaxLength* in *msgA-DMRS-Config* is not configured, the tables shall be used according to single-symbol DM-RS

- if the higher-layer parameter *maxLength* in *DMRS-UplinkConfig* is equal to 'len2', the associated DCI or configured grant configuration determines whether single-symbol or double-symbol DM-RS shall be used

- if the higher-layer parameter *msgA-MaxLength* in *msgA-DMRS-Config* is equal to 'len2', double-symbol DM-RS shall be used

- if the higher-layer parameter *dmrs-AdditionalPosition* is not set to 'pos0' and intra-slot frequency hopping is enabled according to clause 7.3.1.1.2 in [4, TS 38.212] and by higher layer, Tables 6.4.1.1.3-6 shall be used assuming *dmrs-AdditionalPosition* is equal to 'pos1' for each hop.

For PUSCH mapping type A,

- the case *dmrs-AdditionalPosition* equal to 'pos3' is only supported when *dmrs-TypeA-Position* is equal to 'pos2';

- symbols in Table 6.4.1.1.3-4 is only applicable when *dmrs-TypeA-Position* is equal to 'pos2'.

For msgA transmitted using PUSCH mapping type A,

- the case *msgA-DMRS-AdditionalPosition* equal to 'pos3' is only supported when *dmrs-TypeA-Position* is equal to 'pos2';

- *'dmrs-AdditionalPosition*' in Tables Tables 6.4.1.1.3-3 to 6.4.1.1.3-6 shall be replaced by *msgA-DMRS-AdditionalPosition;*

- only PUSCH DM-RS configuration type 1 is supported.

For msgA transmitted using PUSCH mapping type B,

- '*dmrs-AdditionalPosition*' in Tables 6.4.1.1.3-3 to 6.4.1.1.3-6 shall be replaced by *msgA-DMRS-AdditionalPosition*;

- only PUSCH DM-RS configuration type 1 is supported.

#### < Unchanged parts are omitted >