**3GPP TSG RAN WG1 #106-e R1-21xxxxx**

**e-Meeting, August 16th – August 27th, 2021**

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| *CR-Form-v11.2* | | | | | | | | |
| **DRAFT CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **TS38.214** | **CR** | **draft** | **rev** | **-** | **Current version:** | **16.6.0** |  |
|  | | | | | | | | |
| *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:*** | CR to 38.214 clarification on coefficients packing order for Type II CSI | | | | | | | | | |
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| ***Source to WG:*** | Moderator (Qualcomm Incorporated) | | | | | | | | | |
| ***Source to TSG:*** | R1 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | NR\_newRAT-Core | | | | |  | | ***Date:*** | | 2021-08-19 |
|  |  | | | |  | | |  | |  |
| ***Category:*** | **A** |  | | | | | | ***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)* | |
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| ***Reason for change:*** | | In Rel-15 Type II CSI, a precoding matrix on a subband is obtained as linear combination of 2L spatial beams. Each linear combination coefficients are quantized by wideband amplitude (i.e., ), subband amplitude (i.e., ) and subband phase (i.e., ). However, there is no clear description in the current specification on the mapping order of the subband parameters, which may cause ambiguity or even misalignment between UE and gNB.  Based on the discussion in email thread [106-e-NR-7.1CRs-08], companies share the common understanding that elements in , and are reported in the increasing order of their indices. | | | | | | | | |
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| ***Summary of change:*** | | In 38.214, clarify that the elements in , and are reported in the increasing order of their indices. | | | | | | | | |
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| ***Consequences if not approved:*** | | Ambiguity on coefficients reporting order for type II CSI. | | | | | | | | |
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| ***Clauses affected:*** | | 5.2.3 | | | | | | | | |
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|  | | **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 ... | | | |
|  | |  | | | | | | | | |
| ***Other comments:*** | | * It is an alignment of UE and BS behavior based on common understanding among companies. | | | | | | | | |

### 5.2.3 CSI reporting on PUSCH

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For Type I and Type II CSI feedback on PUSCH, a CSI report comprises of two parts. Part 1 has a fixed payload size and is used to identify the number of information bits in Part 2. Part 1 shall be transmitted in its entirety before Part 2.

- For Type I CSI feedback, Part 1 contains RI (if reported), CRI (if reported), CQI for the first codeword (if reported). Part 2 contains PMI (if reported) and contains the CQI for the second codeword (if reported) when RI (if reported) is larger than 4.

- For Type II CSI feedback, Part 1 contains RI (if reported), CQI, and an indication of the number of non-zero wideband amplitude coefficients per layer for the Type II CSI (see clause 5.2.2). The fields of Part 1 – RI (if reported), CQI, and the indication of the number of non-zero wideband amplitude coefficients for each layer – are separately encoded. Part 2 contains the PMI of the Type II CSI. The elements of , (if reported) and (if reported) are reported in the increasing order of their indices, , where the element of the lowest index is mapped to the most significant bits and the element of the highest index is mapped to the least significant bits. Part 1 and 2 are separately encoded.

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