**3GPP TSG-RAN WG1 Meeting #108-e *R1-22xxxxx***

**e-Meeting, February 21 – March 3, 2022**

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| *CR-Form-v12.2* |
| **DRAFT CHANGE REQUEST** |
|  |
|  | **38.212** | **CR** |  | **rev** | **-** | **Current version:** | **17.0.0** |  |
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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:***  | Corrections on coverage enhancements in 38.212  |
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| ***Source to WG:*** | Huawei |
| ***Source to TSG:*** | R1 |
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| ***Work item code:*** | NR\_cov\_enh-Core |  | ***Date:*** | 2022-03-08 |
|  |  |  |  |  |
| ***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 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-16 (Release 16)Rel-17 (Release 17)Rel-18 (Release 18)Rel-19 (Release 19)* |
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| ***Reason for change:*** | Capture the endorsed TP on DCI format 0\_0 from RAN1#107b-e and the agreements on rate matching of TB processing over multiple slots from RAN1#108-e.  |
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| ***Summary of change:*** | 1. Update MCS field of DCI format 0\_0 for Rel-17 Msg3 PUSCH with repetitions
2. Reflect the agreements on rate matching of TB processing over multiple slots.
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| ***Consequences if not approved:*** | The specification for Msg3 PUSCH with repetitions and TB processing over multiple slots is incomplete. |
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| ***Clauses affected:*** | 6.2.5, 7.3.1.1.1 |
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|  | **Y** | **N** |  |  |
| ***Other specs*** | **X** |  |  Other core specifications  | TS 38.213, TS 38.214  |
| ***affected:*** |  | **X** |  Test specifications |  |
| ***(show related CRs)*** |  | **X** |  O&M Specifications |   |
|  |  |
| ***Other comments:*** | **Isolated Impact Analysis:** |
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| ***This CR's revision history:*** |  |

6.2.5 Rate matching

Coded bits for each code block, denoted as , are delivered to the rate match block, where  is the code block number, and  is the number of encoded bits in code block number . The total number of code blocks is denoted by  and each code block is individually rate matched according to Clause 5.4.2 by setting  if higher layer parameter *rateMatching* is set to *limitedBufferRM* and by setting  otherwise, if *numberOfSlotsTBoMS* is not present in the resource allocation table, or if *numberOfSlotsTBoMS* is present in the resource allocation table and the value of *numberOfSlotsTBoMS* in the row indicated by the Time domain resource assignment field in DCI is equal to 1. When the value of *numberOfSlotsTBoMS* in the row indicated by the Time domain resource assignment field in DCI is larger than 1, each code block is individually rate matched per slot according to Clause 5.4.2 by setting

- if higher layer parameter *rateMatching* is set to *limitedBufferRM* and by setting otherwise;

- as the total number of coded bits available for transmission of the transport block in the slot;

- as given by Table 5.4.2.1-2 according to the value of and LDPC base graph if the slot is the first slot within the slots allocated for the transmission of TB processing over multiple slots, and setting if the slot is a slot except for the first one within the slots, where is the value of *numberOfSlotsTBoMS* in the row indicated by the Time domain resource assignment field in DCI, denotes the index of starting coded bit in the previous slot within the slots, is the total number of coded bits available for transmission of the transport block in the previous slot within the slots assuming no UCI multiplexing, and denotes the number of skipped filler bits if any in the previous slot within the slots according to Clause 5.4.2.1 by assuming no UCI multiplexing.

After rate matching, the bits are denoted by, where is the number of rate matched bits for code block number .

< Unchanged parts are omitted >

##### 7.3.1.1.1 Format 0\_0

< Unchanged parts are omitted >

The following information is transmitted by means of the DCI format 0\_0 with CRC scrambled by TC-RNTI:

- Identifier for DCI formats – 1 bit

- The value of this bit field is always set to 0, indicating an UL DCI format

- Frequency domain resource assignment – number of bits determined by the following:

- bits if the higher layer parameter *useInterlacePUCCH-PUSCH* in *BWP-UplinkCommon* is not configured, where

-  is the size of the initial UL bandwidth part.

- For PUSCH hopping with resource allocation type 1:

-  MSB bits are used to indicate the frequency offset according to Table 8.3-1 in Clause 8.3 of [5, TS 38.213], where  if  and  otherwise

-  bits provide the frequency domain resource allocation according to Clause 6.1.2.2.2 of [6, TS 38.214]

- For non-PUSCH hopping with resource allocation type 1:

-  bits provide the frequency domain resource allocation according to Clause 6.1.2.2.2 of [6, TS 38.214]

- If the higher layer parameter *useInterlacePUCCH-PUSCH* in *BWP-UplinkCommon* is configured

- 5 bits provide the frequency domain resource allocation according to Clause 6.1.2.2.3 of [6, TS 38.214] if the subcarrier spacing for the active UL bandwidth part is 30 kHz

- 6 bits provide the frequency domain resource allocation according to Clause 6.1.2.2.3 of [6, TS 38.214] if the subcarrier spacing for the active UL bandwidth part is 15 kHz

- Time domain resource assignment – 4 bits as defined in Clause 6.1.2.1 of [6, TS 38.214]

- Frequency hopping flag – 1 bit according to Table 7.3.1.1.1-3, as defined in Clause 6.3 of [6, TS 38.214]

- Modulation and coding scheme – 5 bits

- If the UE requests repetition of PUSCH scheduled by RAR UL grant [8, TS 38.321], 5 bits as defined in Clause 6.1.2.1 and Clause 6.1.4.1 of [6, TS 38.214];

- otherwise 5 bits as defined in Clause 6.1.4.1 of [6, TS 38.214].

- New data indicator – 1 bit, reserved

- Redundancy version – 2 bits as defined in Table 7.3.1.1.1-2

- HARQ process number – 4 bits, reserved

- TPC command for scheduled PUSCH – 2 bits as defined in Clause 7.1.1 of [5, TS 38.213]

- ChannelAccess-CPext – 2 bits indicating combinations of channel access type and CP extension as defined in Table 7.3.1.1.1-4, or Table 7.3.1.1.1-4A if *ChannelAccessMode-r16* = "*semistatic*" is provided, for operation in a cell with shared spectrum channel access; 0 bit otherwise

- Padding bits, if required.

- UL/SUL indicator – 1 bit if the cell has two ULs and the number of bits for DCI format 1\_0 before padding is larger than the number of bits for DCI format 0\_0 before padding; 0 bit otherwise. The UL/SUL indicator, if present, locates in the last bit position of DCI format 0\_0, after the padding bit(s).

- If 1 bit, reserved, and the corresponding PUSCH is always on the same UL carrier as the previous transmission of the same TB

< Unchanged parts are omitted >