**3GPP TSG RAN WG1 #106-e R1-210xxxx**

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

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| *CR-Form-v12.0* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
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|  | **38.214** | **CR** |  | **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 on sum data rate for tdmSchemeA and fdmSchemeB | | | | | | | | | |
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| ***Source to WG:*** | Moderator (Qualcomm) | | | | | | | | | |
| ***Source to TSG:*** | RAN1 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | NR\_eMIMO, NR\_newRAT-Core | | | | |  | ***Date:*** | | | 2021-08-17 |
|  |  | | | |  | |  | | |  |
| ***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:*** | | In Rel-16 eMIMO, two PDSCH schemes are specified that correspond to multiple (two) repetitions in one slot: In tdmSchemeA, the two repetitions (transmission occasions) have non-overlapping resource allocation in time domain. In fdmSchemeB, the two repetitions (transmission occasions) have non-overlapping resource allocation in frequency domain.  However, in sum data rate limitation in a cell group or data rate limitation for one PDSCH specified in Section 5.1.3 of 38.214, the two repetitions in the above schemes are not considered separately.  This contradicts the corresponding specification for the case of PUSCH with repetition Type B (in which case more than one repetition can exist in one slot similar to tdmSchemeA and fdmSchemeB mntioned above) in Section 6.1.4 of 38.214 where “For PUSCH repetition Type B, each actual repetition is counted separately.” is captured.  From UE complexity point of view with respect to data rate limitation, each repetition should be counted separately due to separate rate matching, which is captured correctly for the case of PUSCH as mentioned above, but not for the case of PDSCH (for tdmSchemeA and fdmSchemeB). | | | | | | | | |
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| ***Summary of change:*** | | Specify that each PDSCH repetition is counted separately for data rate limitation in Section 5.1.3 of 38.214. | | | | | | | | |
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| ***Consequences if not approved:*** | | Existence of more than one PDSCH repetition in one slot is not captured in data rate limitation in the current specification, which can lead to increased UE complexity and inconsistent behavior compared to PUSCH with repetition Type B. | | | | | | | | |
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| ***Clauses affected:*** | | 5.1.3 | | | | | | | | |
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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:*** | |  | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | |  | | | | | | | | |

5.1.3 Modulation order, target code rate, redundancy version and transport block size determination

**<unchanged text omitted>**

Within a cell group, a UE is not required to handle PDSCH(s) transmissions in slot *sj* in serving cell-*j*, and for *j* = 0,1,2.. *J-1*, slot *sj* overlapping with any given point in time, if the following condition is not satisfied at that point in time:

where,

- *J* is the number of configured serving cells belonging to a frequency range

- for the *j-th* serving cell,

*- M* is the number of TB(s) transmitted in slot *sj*. If there are two PDSCH transmission occasions of the same TB (in time domain or in frequency domain) in the slot *sj*, each transmission occasion is counted separately.

*- Tslotμ(j)* =10-3/2*μ(j)*, where *μ(j)* is the numerology for PDSCH(s) in slot *sj* of the *j*-th serving cell.

- for the *m*-th TB,

*- A* is the number of bits in the transport block as defined in Clause 7.2.1 [5, TS 38.212]

*- C* is the total number of code blocks for the transport block defined in Clause 5.2.2 [5, TS 38.212].

*-*  is the number of scheduled code blocks for the transport block as defined in Clause 5.4.2.1 [5, TS 38.212]

- [Mbps] is computed as the maximum data rate summed over all the carriers in the frequency range for any signaled band combination and feature set consistent with the configured servings cells, where the data rate value is given by the formula in Clause 4.1.2 in [13, TS 38.306], including the scaling factor *f(i).*

For a *j-*th serving cell, if higher layer parameter *processingType2Enabled* of *PDSCH-ServingCellConfig* is configured for the serving cell and set to '*enable',* or if at least one *IMCS >* *W* for a PDSCH, where *W* = 28 for MCS tables 5.1.3.1-1 and 5.1.3.1-3, and *W* = 27 for MCS table 5.1.3.1-2, the UE is not required to handle PDSCH transmissions, if the following condition is not satisfied:

where

- is the number of symbols assigned to the PDSCH. For a PDSCH that consists of two PDSCH transmission occasions in time domain in one slot, is the number of symbols of one transmission occasion.

- M is the number of TB(s) in the PDSCH

- where *μ* is the numerology of the PDSCH

- for the *m*-th TB,

*- A* is the number of bits in the transport block as defined in Clause 7.2.1 [5, TS 38.212]

*- C* is the total number of code blocks for the transport block defined in Clause 5.2.2 [5, TS 38.212]

*-*  is the number of scheduled code blocks for the transport block as defined in Clause 5.4.2.1 [5, TS 38.212]

- [Mbps] is computed as the maximum data rate for a carrier in the frequency band of the serving cell for any signaled band combination and feature set consistent with the serving cell, where the data rate value is given by the formula in Clause 4.1.2 in [13, TS 38.306], including the scaling factor *f(i).*