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

**E-meeting, January 25 – February 5, 2021**

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| *CR-Form-v12.1* |
| **[DRAFT] CHANGE REQUEST** |
|  |
|  | **38.214** | **CR** | **xxxx** | **rev** | **-** | **Current version:** | **16.4.0** |  |
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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:***  | CR on PDSCH QCL  |
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| ***Source to WG:*** | Moderator (OPPO), Apple |
| ***Source to TSG:*** | R1 |
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| ***Work item code:*** | NR\_newRAT-Core |  | ***Date:*** | 2021-01-25 |
|  |  |  |  |  |
| ***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 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-15 (Release 15)Rel-16 (Release 16)**Rel-17 (Release 17)Rel-18 (Release 18)* |
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| ***Reason for change:*** | In TS 38.214, it is specified that gNB should ensure the PDSCH and SSB are QCLed when they are multiplexed in the same symbol. In multi-TRP operation, DMRS of PDSCH(s) would have two different QCL properties. In S-DCI based multi-TRP, one PDSCH could be indicated with two TCI states. In M-DCI based multi-TRP, two PDSCHs with different TCI states transmitted from different TRP could overlap in time domain. According to the specification in current TS38.214, it would restrict the system to ensure that PDSCH(s) with two TCI-states in multi-TRP system is QCLed with SSB if they are multiplexed with SSB on one same symol. That would cause big restriction to system scheduling.  |
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| ***Summary of change:*** | Specify that in multi-TRP system, the system should ensure that at least one PDSCH is QCLed with the SSB when the PDSCH(s) and an SSB are in the same OFDM symbol.  |
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| ***Consequences if not approved:*** | It would impose uncessary restritcion on system scheduling. |
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| ***Clauses affected:*** | 5.1.6.2 |
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|  | **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:*** | Isolated impact analysis:* No impact to existing gNB and UE implementation.
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| ***This CR's revision history:*** |  |

#### 5.1.6.2 DM-RS reception procedure

\*\*\* Unchanged text is omitted \*\*\*

If the UE receives the DM-RS for PDSCH and an SS/PBCH block in the same OFDM symbol(s), then the UE may assume that the DM-RS and SS/PBCH block are quasi co-located with 'QCL-TypeD', if 'QCL-TypeD' is applicable. Furthermore, the UE shall not expect to receive DM-RS in resource elements that overlap with those of the SS/PBCH block, and the UE can expect that the same or different subcarrier spacing is configured for the DM-RS and SS/PBCH block in a CC except for the case of 240 kHz where only different subcarrier spacing is supported.

If at least one TCI codepoint indicates two TCI states and the UE receives the DM-RS for PDSCH and an SS/PBCH block in the same OFDM symbol(s), then the UE may assume that at least one DM-RS port for the PDSCH and SS/PBCH block are quasi co-located with 'QCL-TypeD', if 'QCL-TypeD' is applicable.

If the UE is configured by higher layer parameter PDCCH-Config that contains two different values of CORESETPoolIndex in different ControlResourceSets, and the UE receives the DM-RS for PDSCH(s) and an SS/PBCH block in the same OFDM symbol(s), then the UE may assume that at least one DM-RS port for the PDSCH(s) and SS/PBCH block are quasi co-located with 'QCL-TypeD', if 'QCL-TypeD' is applicable.

##### \*\*\* Unchanged text is omitted \*\*\*