**3GPP TSG-RAN WG1#84bis R1-163508**

**Busan, Korea, 11th - 15th April 2016**

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| *CR-Form-v11* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **36.213** | **CR** | **0628** | **rev** | **-** | **Current version:** | **13.1.1** |  |
|  | | | | | | | | |
| *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:*** | MCS Table for Initial Partial TTI in LAA | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | Ericsson, Panasonic | | | | | | | | | |
| ***Source to TSG:*** | R1 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | LTE\_LAA-Core | | | | |  | | ***Date:*** | | 2016-04-10 |
|  |  | | | |  | | |  | |  |
| ***Category:*** | **F** |  | | | | | | ***Release:*** | | Rel-13 |
|  | *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-4 (Release 4) Rel-5 (Release 5) Rel-6 (Release 6) Rel-7 (Release 7) Rel-8 (Release 8) Rel-9 (Release 9) Rel-10 (Release 10) Rel-11 (Release 11) Rel-12 (Release 12) Rel-13 (Release 13)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | In an initial partial TTI for LAA, code rates for most MCS entries become too high to be useable (above the 0.931 UE decoding threshold or 1). When the UE is not configured to use the MCS table with 256QAM support, only one MCS entry supports 16QAM and 64QAM cannot be used. When UE is is configured to use the MCS table with 256QAM support, only QPSK modulation is supported and all higher order modulations are disabled by excessively high code rate. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | Modulation orders of the MCS entries are modified to reduce the code rates in an initial partial TTI below 0.931 and into suitable code rate ranges for the modulations. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | Higher order modulations and high data rate cannot be achieved. Link performance based on the remaining usable MCS entries is degraded because the code rates exceed the suitable code rate ranges for the modulations. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 7.1.7.1 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **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 change affects only the modulation order determination of initial partial TTI in frame structure 3. | | | | | | | | |

#### 7.1.7.1 Modulation order determination

For BL/CE UEs configured with CEModeA, is used in place of in the rest of this subclause.

The UE shall use **=** 2 if the DCI CRC is scrambled by P-RNTI, RA-RNTI, or SI-RNTI, or if PDSCH is assigned by MPDCCH DCI Format 6-1B, or if PDSCH carriers *SystemInformationBlockType1-BR*, or if PDSCH carries BL/CE SI messages, otherwise,

- if the higher layer parameter *altCQI-Table-r12* is configured, and if the PDSCH is assigned by a PDCCH/EPDCCH with DCI format 1/1B/1D/2/2A/2B/2C/2D with CRC scrambled by C-RNTI,

- if the assigned PDSCH is transmitted only in the second slot of a subframe, the UE shall useand Table 7.1.7.1-1A to determine the modulation order (). The modulation order () used in the physical downlink shared channel is set to ;

- otherwise, the UE shall useand Table 7.1.7.1-1A to determine the modulation order () used in the physical downlink shared channel.

- else

- if the assigned PDSCH is transmitted only in the second slot of a subframe, the UE shall useand Table 7.1.7.1-1 to determine the modulation order (). The modulation order () used in the physical downlink shared channel is set to ;

- otherwise, the UE shall useand Table 7.1.7.1-1 to determine the modulation order (****) used in the physical downlink shared channel.

Table 7.1.7.1-1: Modulation and TBS index table for PDSCH

|  |  |  |  |
| --- | --- | --- | --- |
| MCS Index | Modulation Order | Modulation Order | TBS Index |
| **0** | 2 | 2 | 0 |
| **1** | 2 | 2 | 1 |
| **2** | 2 | 2 | 2 |
| **3** | 2 | 2 | 3 |
| **4** | 2 | 2 | 4 |
| **5** | 2 | 4 | 5 |
| **6** | 2 | 4 | 6 |
| **7** | 2 | 4 | 7 |
| **8** | 2 | 4 | 8 |
| **9** | 2 | 4 | 9 |
| **10** | 4 | 6 | 9 |
| **11** | 4 | 6 | 10 |
| **12** | 4 | 6 | 11 |
| **13** | 4 | 6 | 12 |
| **14** | 4 | 6 | 13 |
| **15** | 4 | 6 | 14 |
| **16** | 4 | 6 | 15 |
| **17** | 6 | 6 | 15 |
| **18** | 6 | 6 | 16 |
| **19** | 6 | 6 | 17 |
| **20** | 6 | 6 | 18 |
| **21** | 6 | 6 | 19 |
| **22** | 6 | 6 | 20 |
| **23** | 6 | 6 | 21 |
| **24** | 6 | 6 | 22 |
| **25** | 6 | 6 | 23 |
| **26** | 6 | 6 | 24 |
| **27** | 6 | 6 | 25 |
| **28** | 6 | 6 | 26/26A |
| **29** | 2 | 2 | reserved |
| **30** | 4 | 4 |
| **31** | 6 | 6 |

Table 7.1.7.1-1A. Modulation and TBS index table 2 for PDSCH

|  |  |  |  |
| --- | --- | --- | --- |
| **MCS Index** | **Modulation Order** | **Modulation Order** | **TBS Index** |
| **0** | 2 | 2 | 0 |
| **1** | 2 | 2 | 2 |
| **2** | 2 | 2 | 4 |
| **3** | 2 | 4 | 6 |
| **4** | 2 | 4 | 8 |
| **5** | 4 | 6 | 10 |
| **6** | 4 | 6 | 11 |
| **7** | 4 | 6 | 12 |
| **8** | 4 | 6 | 13 |
| **9** | 4 | 6 | 14 |
| **10** | 4 | 8 | 15 |
| **11** | 6 | 8 | 16 |
| **12** | 6 | 8 | 17 |
| **13** | 6 | 8 | 18 |
| **14** | 6 | 8 | 19 |
| **15** | 6 | 8 | 20 |
| **16** | 6 | 8 | 21 |
| **17** | 6 | 8 | 22 |
| **18** | 6 | 8 | 23 |
| **19** | 6 | 8 | 24 |
| **20** | 8 | 8 | 25 |
| **21** | 8 | 8 | 27 |
| **22** | 8 | 8 | 28 |
| **23** | 8 | 8 | 29 |
| **24** | 8 | 8 | 30 |
| **25** | 8 | 8 | 31 |
| **26** | 8 | 8 | 32 |
| **27** | 8 | 8 | 33/33A |
| **28** | 2 | 2 | reserved |
| **29** | 4 | 4 |
| **30** | 6 | 6 |
| **31** | 8 | 8 |