3GPP TSG-RAN WG4 Meeting #98bis-e R4-2106091

Electronic Meeting, 12 April – 20 April 2021

Agenda Item: 7.25.6

Source: Ericsson

Title: Way forward on UE demodulation and CQI reporting for channel bandwidths 35MHz and 45MHz for NR FR1

Document for: Approval

# Way forward

## Demodulation performance requirement

* Support of 35MHz and 45MHz bandwidth for SDR tests
	+ Update TS38.101-4 Table 5.2-2 and Table 5.5A-4 (the number of PRBs in CORESET for PDCCH configuration) to support the new CBW 35MHz/45MHz
* Define PDSCH CA requirements for 35MHz and 45MHz bandwidth in FDD
	+ Simulation assumption for PDCSH CA demodulation requirements are given in Table 1 and Appendix. Interested companies are encouraged to provide the simulation results in RAN4#99-e.
	+ It is suggested to revise WID to define PDSCH CA demodulation requirements for channel bandwidths 35MHz and 45MHz.
* CR preparation
	+ Huawei (Rapporteur) provides the corresponding CR.

Table 1 Test cases for PDSCH demodulation for CA with 35MHz and 45MHz CBW

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Test number | Bandwidth (MHz) | Reference channel | Modulation format and code rate | Propagation condition | Correlation matrix and antenna configuration | Reference value |
| Fraction of maximum throughput (%) | SNR (dB) |
| 1 | 35 | R.PDSCH.1-10.X FDD | 16QAM, 0.48 | TDLA30-10 | 2x2, ULA Low | 70 | TBD |
| 2 | 45 | R.PDSCH.1-10.Y FDD | 16QAM, 0.48 | TDLA30-10 | 2x2, ULA Low | 70 | TBD |
| 3 | 35 | R.PDSCH.1-10.X FDD | 16QAM, 0.48 | TDLA30-10 | 2x4, ULA Low | 70 | TBD |
| 4 | 45 | R.PDSCH.1-10.Y FDD | 16QAM, 0.48 | TDLA30-10 | 2x4, ULA Low | 70 | TBD |

## CSI reporting requirements

* Introduction of CA CQI requirements for 35MHz and 45MHz bandwidth (FDD)
	+ Add the subband size in TS38.101-4 Table 6.2A.3.1.1-2.
	+ Companies to verify if existing requirements hold for CBWs of 35MHz and 45MHz for FR1 FDD.
	+ It is suggested to revise WID to define CA CQI reporting requirements for channel bandwidths 35MHz and 45MHz.
* CR preparation
	+ Huawei (Rapporteur) provides the corresponding CR.

# Appendix simulation assumption

Please use R.PDSCH.1-10.X FDD and R.PDSCH.1-10.Y FDD for simulations of 35MHz and 45MHz.

Table A.3.2.1.1-10: PDSCH Reference Channel for FDD CC and CA scenario (TS 38.101-4)

|  |  |  |
| --- | --- | --- |
| **Parameter** | **Unit** | **Value** |
| Reference channel |  | R.PDSCH.1-10.1 FDD | R.PDSCH.1-10.2 FDD | R.PDSCH.1-10.X FDD | R.PDSCH.1-10.Y FDD |  |
| Channel bandwidth | MHz | 40 | 50 | 35 | 45 |  |
| Subcarrier spacing | kHz | 15 | 15 | 15 | 15 |  |
| Number of allocated resource blocks | PRBs | 216 | 270 | 188 | 242 |  |
| Number of consecutive PDSCH symbols |  | 12 | 12 | 12 | 12 |  |
| Allocated slots per 2 frames | Slots | 19 | 19 | 19 | 19 |  |
| MCS table |  | 64QAM | 64QAM | 64QAM | 64QAM |  |
| MCS index |  | 13 | 13 | 13 | 13 |  |
| Modulation |  | 16QAM | 16QAM | 16QAM | 16QAM |  |
| Target Coding Rate |  | 0.48 | 0.48 | 0.48 | 0.48 |  |
| Number of MIMO layers |  | 2 | 2 | 2 | 2 |  |
| Number of DMRS REs |  | 12 | 12 | 12 | 12 |  |
| Overhead for TBS determination |  | 0 | 0 | 0 | 0 |  |
| Information Bit Payload per Slot  |  |  |  |  |  |  |
| For Slot i = 0 | Bits | N/A | N/A | N/A | N/A |  |
| For Slots i = 1,…, 19 | Bits | 108552 | 135296 | 94248 | 122976 |  |
| Transport block CRC per Slot |  |  |  |  |  |  |
| For Slot i = 0 | Bits | N/A | N/A | N/A | N/A |  |
| For Slots i = 1,…, 19 | Bits | 24 | 24 | 24 | 24 |  |
| Number of Code Blocks per Slot |  |  |  |  |  |  |
| For Slot i = 0 | CBs | N/A | N/A | N/A | N/A |  |
| For Slots i = 1,…, 19 | CBs | 13 | 17 |  |  |  |
| Binary Channel Bits Per Slot |  |  |  |  |  |  |
| For Slot i = 0 | Bits | N/A | N/A | N/A | N/A |  |
| For Slots i = 10, 11 | Bits | 217728 | 272160 | 189504 | 243936 |  |
| For Slots i =1,…, 9, 12, …, 19 | Bits | 228096 | 285120 | 198528 | 255552 |  |
| Max. Throughput averaged over 2 frames | Mbps | 103.124 | 128.531 | 89.536 | 116.827 |  |
| Note 1: SS/PBCH block is transmitted in slot #0 with periodicity 20 msNote 2: Slot i is slot index per 2 frames |