**3GPP TSG-RAN WG4 Meeting # 99-e R4-210XXXX**

**Online, May 19-27, 2021**

**Agenda item:** 6.1.7.1, 6.1.7.2, 6.1.7.3

**Source:** Qualcomm

**Title:** Email discussion summary for [99-e][321]

**Document for:** Information

# Introduction

List of candidate target of email discussion for 1st round and 2nd round

* 1st round: Agree on the issues pending from the last RAN4 meeting, discuss the final requirements based on the simulation results shared by the companies, review proposed draft CR;
* 2nd round: Keep discussing on issues pending from the 1st round;

# Topic #2: Demodulation Requirements (PDSCH and CQI)

## Companies’ contributions summary

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| **T-doc number** | **Company** | **Proposals / Observations** |
| R4-2109352 | Apple | Proposal #1: Define requirements for Scenario A and C for 20MHz CBW. |
| R4-2109354 | Apple | Proposal #1: In slot 1 of FFP configure Aperiodic CSI report with aperiodic report slot offset of 6.  Proposal #2: Use same downlink transmission scheme as agreed for PDSCH demod requirements.  Proposal #3: Re-use the test parameters from CQI reporting tests in static channel for unlicensed carrier where applicable.  Proposal #4: Define CQI reporting requirements for NR-U with the same SNR pair as Test 1 for existing CQI reporting tests in static channel.  Proposal #5: Define minimum delta of median CQI of 2 for different transmission burst. |
| R4-2109588 | Ericsson | Issue 1-3: Requirement definition method for Scenario A and C.  Observation: The maximum bandwidth for PCell is 40MHz for n66 and 20MHz for n25 and n48.  Proposal 1: Configure TDD 20MHz for PCell in the test setup.  Observation: There is no statement for mandatory UE supported bandwidth.  Proposal 2: Define PDSCH requirements for {20, 40, 60, 80} MHz NR-U unlicensed cell. Only test the largest supported bandwidth for both Scenario A and C.  Issue 2: CQI report scheduling  Observation: Periodic CQI report could not fit in agreed burst transmission model.  Observation: The gap between aperiodic CSI report and its reference CSI-RS could be much smaller than periodic CSI report situation.  Proposal 3: Taking aperiodic CQI report for NR-U CQI report requirement test. |
| R4-2109591 | Ericsson | Proposal 1: Use aperiodic CQI report to fit for agreed burst transmission structure.  Proposal 2: Only define NR-U CQI report requirement for 2Rx.  Proposal 3: Consider following SNR configuration for CQI report requirement.  Option 1: Low SNR burst set [3, 4] dB, high SNR burst set [9, 10];  Option 2: Low SNR burst set [7, 8] dB, high SNR burst set [13, 14]; |
| R4-2110500 | Huawei | Observation 1: It is optional for a UE to support a specific bandwidth for a given band.  Proposal 1: Define the 20MHz for license band and define the requirements for 20MHz, 40MHz, 60MHz and 80MHz for unlicensed band with the following applicability rules:  - For scenario A: After selecting the largest NR-U supported CBW by the UE, configure NR PCell with 20 MHz CBW in combination with selected NR-U CBW;  - For scenario C: Only test the supported largest channel bandwidth. |
| R4-2110502 | Huawei | Proposal 1: Use CQI Table 2.  Proposal 2: Set SNR pair to [8, 9]dB without power level boost for 2RX and Set SNR pair to [5, 6]dB without power level boost for 4RX and set minimum delta CQI for transmission burst with different power level boost to 2  Proposal 3: Use periodic CQI reporting.  Proposal 4: Set CQI reporting periodicity and offset to 10 slots/ 9 slots and schedule PUCCH format 2 to transmit CQI information CQI in the first two symbols of last slot in each FFP.  Proposal 5: Reuse the codebook configuration of Rel-15 CQI testing.  Proposal 6: Change the S2 from {6, 9, 12, 14} to {14}.i.e. Always schedule full slots in the LBT burst transmission for NR-U CQI testing. |
| R4-2110718 | Qualcomm | Proposals 1: For NR-U CQI Performance tests, use CQI Table 2.  Proposals 2: For NR-U CQI Performance tests, use CodebookSubsetRestriction 010000.  Proposal 3: For NR-U CQI Performance tests, define requirements for 2RX using SNR [8, 9] dB, with the applicability rule that satisfying the requirement for one SNR point is sufficient.  Proposal 4: For NR-U CQI Performance tests, define requirements for 4RX using SNR [5, 6] dB, with the applicability rule that satisfying the requirement for one SNR point is sufficient.  Proposal 4: For NR-U CQI Performance tests, use the applicability rule to test UEs only for the largest supported number of RX.  Proposal 4: Regarding the passing criteria for NR-U CQI Performance tests, the Median CQI delta across reporting based on different power boost should be larger than 2, for both 2RX and 4RX. |
| R4-2110766 | Qualcomm | Observation 1: Previous agreements were to define NR-U PDSCH demodulation requirements for the unlicensed carrier for BW {20,40,60,80} MHz and test the largest supported BW only.  Observation 2: For operations in unlicensed bands, support for BW {20, 40, 60, 80} MHz is mandatory.  Observation 3: Impact of CBW on the SNR requirement is limited (<1dB difference among proposed CBW options).  Proposal 1: In line with current agreements, define and test NR-U UE PDSCH Performances requirements for 80MHz only.  Proposal 2: Same as NR-U PDSCH, NR-U UE CQI Performances requirements should be defined and tested for 80MHz only.  Proposal 3: For Scenario A, configure the NR PCell with CBW = 20MHz.  Proposal 4: According to the proposals in this contribution for defining a single requirement CBW (for both NR licensed CC and NR Unlicensed CC), test applicability rules for largest supported CBW in NR-U PDSCH Tests are not needed and should not be included.  Observation 4: The minimum gap between CSI-RS scheduling and Periodic CQI reporting is 8 slots for 30kHz SCS.  Observation 5: Periodic CQI reporting would constraint CSI-RS scheduling and CQI Reporting to Slot #0 and Slot #9 respectively, within each 5ms periodicity.  Observation 6: The minimum delay between CSI-RS scheduling and Aperiodic CSI reporting is 33 Symbols, which can fit within the 5ms periodicity, leaving the last slot completely idle.  Proposal 5: To keep last slot as idle and avoid conflicts with SSB slot, use CSI-RS scheduling with periodicity 10 slots and offset 1 slot and Aperiodic CSI Report type. |
| R4-2110947 | Intel | Observation 1: TD multiplexing of DRS with data can take place only if data has BW equal to 20MHz. Otherwise another LBT for data is required  Observation 2: DRS occupies first two slots, which overlaps with candidate positions for CSI-RS transmission.  Proposal 1: Define dedicated COT for DRS transmission equal to 1ms (i.e. no TD multiplexing of DRS with data)  Proposal 2: Define DRS periodicity equal to 40ms  Proposal 3: For periodic CQI reporting define CSI-RS periodicity and offset as 10 and 0 slots respectively  Proposal 4: For periodic CQI reporting define CSI-Report periodicity and offset as 10 and 8 slots respectively |
| R4-2109592 | Ericsson | CQI Simulation Results |
| R4-2110502 | Huawei | CQI Simulation Results |

## Open issues summary

The issues listed in this section address topics for discussions related to issue both general and specific for PDSCH performance testing.

### Sub-topic 1-1: DRS Configuration

**Issue 1-1-1: Whether to define a dedicated COT for DRS transmission**

* Proposals
  + Option 1: No, multiplex DRS and data in TD within the same COT, without multiplexing SSB and data in the same slot (Current WF);
  + Option 2: Yes, define dedicated COT for DRS equal to 1ms, without multiplexing in TD DRS and Data (Intel);
* Recommended WF:
  + TBA;

---------------GTW Note------------

Intel: multiplexing DRS and data with mixed BW is not supported in our view.

QC: We think no need to be aligned BW for DRS and data.

Intel: We need perform another LBT.

Agreement: Option 1.

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| **Company** | **Comments** |
| Qualcomm | We identified two problems raised by Intel in their contribution regarding the current agreements on the DRS window, and it is our view that they do not motivate defining a dedicated COT for DRS.  The observations are:   1. *TD multiplexing of DRS with data can take place only if data has BW equal to 20MHz. Otherwise another LBT for data is required;*   We do not see an impediment in having the NB perform LBT after the end of the transmission of the SSB to continue with the PDSCH transmission as agreed over all the subbands, for tests with CBW larger than 20MHz.  For dynamic channel access these two separate transmission does not seem to pose a problem.  For semi-static channel access, according to 37.213, Section 4.3, multiple DL transmission bursts within the COT can be transmitted as long as the gNB performs LBT appropriately.   |  | | --- | | A channel occupancy initiated by a gNB and shared with UE(s) satisfies the following:  - The gNB shall transmit a DL transmission burst starting at the beginning of the channel occupancy time immediately after sensing the channel to be idle for at least a sensing slot duration Tsi=9us. If the channel is sensed to be busy, the gNB shall not perform any transmission during the current period.  - The gNB may transmit a DL transmission burst(s) within the channel occupancy time immediately after sensing the channel to be idle for at least a sensing slot duration Tsi=9us if the gap between the DL transmission burst(s) and any previous transmission burst is more than 16us. |  1. *DRS occupies first two slots, which overlaps with candidate positions for CSI-RS transmission*.   Unless there are other reasons why this should be avoided, this possibility seems to be contemplated and allowed according to the spec in 37.213, Section 4.0   |  | | --- | | A discovery burst refers to a DL transmission burst including a set of signal(s) and/or channel(s) confined within a window and associated with a duty cycle. The discovery burst can be any of the following:  - Transmission(s) initiated by an eNB that includes a primary synchronization signal (PSS), secondary synchronization signal (SSS) and cell-specific reference signal(s)(CRS) and may include non-zero power CSI reference signals (CSI-RS).  - Transmission(s) initiated by a gNB that includes at least an SS/PBCH block consisting of a primary synchronization signal (PSS), secondary synchronization signal (SSS), physical broadcast channel (PBCH) with associated demodulation reference signal (DM-RS) and may also include CORESET for PDCCH scheduling PDSCH with SIB1, and PDSCH carrying SIB1 and/or non-zero power CSI reference signals (CSI-RS). |   In conclusion, it’s our view that no modifications need to be done to the current DRS window assumption, so support option 1. |
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**Issue 1-1-2: DRS Duration, Periodicity**

* Proposals
  + Option 1: 1ms duration, 20ms periodicity (Current WF);
  + Option 2: 1ms duration, 40ms periodicity (Intel);
* Recommended WF:
  + TBA;

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| **Company** | **Comments** |
| Qualcomm | Option 1, keep current DRS agreements. |
| Apple | Option 1. We don’t see strong reason to change the DRS periodicity. |
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### Sub-topic 1-2: Bandwidth configuration

**Issue 1-2-1: Bandwidth to be used for PDSCH requirement definition, NR Unlicensed CC (Scenario A and C)**

* Proposals
  + Option 1: 20 MHz (Apple);
  + Option 2: 80 MHz (Qualcomm);
  + Option 2: Define requirements for {20, 40, 60, 80} and test the largest supported unlicensed CBW only (Current WF, Ericsson, Huawei);
* Recommended WF:
  + According to the current agreement in the WF and the observation from most of the companies, define requirements for {20, 40, 60, 80} and test the largest supported unlicensed CBW only.

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| **Company** | **Comments** |
| MediaTek | Support the WF. |
| Qualcomm | Support the WF |
| Apple | Option 1. The current WF agreement to define requirements/test for largest supported unlicensed CBW makes sense if we are testing CA requirements. We are configuring for CA in case of scenario A, but we don’t test the licensed carrier. This makes it like any other testcase we have defined since Rel-15 for PDSCH demod. We agreed to only define requirements for 15KHz/10MHz for FSS case, irrespective of what CBWs are supported by the UE. Why should it be different for unlicensed carrier? Hence, we proposed to introduce requirements only for 20MHz CBW which is the LBT BW. |

-------GTW Note------

QC: We have only single Test, for NR we have several test cases. Test overhead should not be a concern since only single test can be applied.

Agreements:

PDSCH demod: Define requirements for {20, 40, 60, 80} and test the largest supported unlicensed CBW only

CSI: only 20MHz CHBW will be introduced

Define requirements configuring the NR PCell with CBW=20MHz (TDD) fpr scenario A.

**Issue 1-2-2: Bandwidth to be used for PDSCH requirement definition, NR PCell CC (Scenario A)**

* Proposals
  + Option 1: 20 MHz (Ericsson, Huawei, Qualcomm);
* Recommended WF:
  + Define requirements configuring the NR PCell with CBW=20MHz (TDD);

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| **Company** | **Comments** |
| MediaTek | Support the WF. |
| Qualcomm | Support the WF |
| Apple | We support the WF. |

**Issue 1-2-3: Bandwidth to be used for CQI requirement definition (Scenario A and C)**

* Proposals
  + Option 1: 20 MHz (Huawei, from draftCR);
  + Option 2: Use the same BW and applicability rule as in the proposed WF for PDSCH (Qualcomm);
* Recommended WF:
  + TBA;

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| **Company** | **Comments** |
| MediaTek | Support Option 1. |
| Qualcomm | It is our view that the same discussion we had on PDSCH regarding on CBW support applies here. For this reason, it would make sense to define the CQI reporting test for BW ={20, 40, 60, 80}MHz and use the same applicability rule to test the largest CBW supported only.  This should not have a repercussion on the CQI requirements, which should be applied to all CBWs. |
| Apple | We propose to only define requirements for 20MHz case, same as PDSCH demod. |

### Sub-topic 1-3: PDSCH Performance Test Requirements

**Issue 1-3-1: SNR Requirement definition**

* Proposals
  + Option 1: TBA;
* Recommended WF

Based on the Impairment results collected, propose and discuss the PDSCH SNR Requirements

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| **Company** | **Comments** |
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### Sub-topic 1-4: Configuration for CQI Performance Tests

**Issue 1-4-1: Number of UE RX Antennas to define CQI requirements for**

* Proposals
  + Option 1: 2 RX (Ericsson);
  + Option 2: {2, 4} RX (Huawei);
  + Option 3: {2, 4} RX, with the applicability rule to test UEs only for the largest supported number of RX (Qualcomm);
* Recommended WF
  + TBA

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| **Company** | **Comments** |
| MediaTek | Support Option 3 which follows CQI tests in Rel-15. |
| Qualcomm | Support Option 3. |
| Apple | Option 3 is fine, but do we have similar applicability rule for PDSCH demod as well? |

**---------------GTW Note---------------**

Huawei: For core spec, band n46, n96 ; 4Rx is optional. 2Rx is enough on band n46.

**Agreement:**

{2, 4} RX, with the applicability rule to test UEs only with applicable rules based on UE declared capability. Further work on the text into specifications.

**Issue 1-4-2: Periodic CSI-RS Resource Periodicity/Slot Offset**

* Proposals
  + Option 1: 10/1 Slots (Current WF);
  + Option 2: 10/0 Slots (Intel);
* Recommended WF:
  + TBA;

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| **Company** | **Comments** |
| Qualcomm | Support Option 1. |
| Apple | We might need to change it to aperiodic CSI-RS based on discussion in Issue 1-4-3? |

**Issue 1-4-3: CSI Reporting Type and Periodicity and Slot Offset or Aperiodic Report Slot Offset**

* Proposals
  + Option 1: Aperiodic (Apple, Ericsson, Qualcomm)
    - Option 1a: Aperiodic Report Slot Offset 7 Slots (Apple);
  + Option 2: Periodic (Huawei, Intel)
    - Periodicity/Offset 10/9 Slots (Huawei);
    - Periodicity/Offset 10/8 Slots (Intel);
* Recommended WF:
  + TBA;

---------------------GTW Note ---------------

Apple: DCI 1-0, and aperiodic CSI –RS resource and reporting type should be used.   
QC: We share similar view as Apple. We don’t think SSB occsication in 2 slot without PDSCH scheduling have big impact on testing.

MTK: Aperiodic CSI report and periodic CSI-RS.

Huawei: Test time will be increased for that case/

Ercisson: If we use aperiodic CSI-RS, and skip PDSCH in CSI-RS slots. Two step approach can be applied.

QC: only impact on 2 slots with SSB. 6% increased. Two step approach will no issue at all.

Apple: Use Downlink length of COT for PDSCH and CQI test cases, that’s the approach used in LAA.

Agreement:

Aperiodic for CSI reporting type

* Not include 2 slot DL transmission duration into COT pattern for CSI test cases
* FFS periodic CSI-RS resource or aperiodic CSI-RS resources

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| **Company** | **Comments** |
| MediaTek | There is a restriction for CQI test in Rel-15 that PDSCH is not scheduled on slots containing CSI-RS or slots which are not full DL.  Also, according to specification TS38.213, UE cancels the CSI-RS reception if UE does not detect a DCI format indicating a periodic CRS-RS reception or scheduling a PDSCH reception.   |  | | --- | | For operation with shared spectrum channel access, if a UE is provided *csi-RS-ValidationWith-DCI*, is not provided *CO-DurationsPerCell*, and is not provided *SlotFormatCombinationsPerCell*, and if the UE is configured by higher layers to receive a CSI-RS in a set of symbols of a slot, the UE cancels the CSI-RS reception in the set of symbols of the slot if the UE does not detect a DCI format indicating an **aperiodic CSI-RS reception or scheduling a PDSCH reception** in the set of symbols of the slot. |   If we do follow the restriction, UE will not be able to do CSI-RS validation as no PDCCH for scheduling PDSCH is transmitted. To valid the CRI-RS reception, we may use aperiodic CRI-RS reporting with DCI format 0-1. However, if we do not follow the restriction and allocate PDSCH in the same slot as CRI-RS, we think periodic reporting can be adopted.  We think this issue is related to issue 1-4-5 and we need to determine first whether to follow the restriction for CQI test in Rel-15. |
| Qualcomm | The problem raised by MediaTek in the previous comment is valid, but the specification states that UEs are supposed to validate scheduled Periodic CSI-RS when detecting a DCI format aperiodic CSI-RS reception.  So reviewing the current agreement in the WF for CSI-RS type and using aperiodic CSI-RS for CSI reporting scheduling would be a viable solution for this issue.  As a consequence, aperiodic CSI reporting should be used, so support option 1. |
| Apple | We support option 1a.  We brought up this issue in our contribution as well for UE not being validate CSI-RS since PDSCH is not transmitted.  ***Observation #1:*** *For CQI reporting requirements, we don’t transmit CSI-RS and PDSCH in the same slot. The UE will not be able to do CSI-RS validation with periodic CSI-RS transmitted with periodicity 10 slots and offset 1 since no PDCCH scheduling data is transmitted.*  Our understanding was that configuring PDCCH in the slot with aperiodic CSI report trigger would be sufficient. But if it should be aperiodic CSI-RS, then we would need to have to configure aperiodic CSI-RS as well and only aperiodic reporting will not be a valid test setup. |

**Issue 1-4-4: CSI Reporting UL Scheduling Type**

* Proposals
  + Option 1: PUCCH Format 2 (Huawei);
* Recommended WF:
  + TBA;

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| **Company** | **Comments** |
| Qualcomm | If aperiodic CSI reporting is chosen in issue 1-4-3, use PUSCH. |
| Apple | It would have to be PUSCH based on aperiodic reporting. |
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**Issue 1-4-5: Downlink Transmission Scheme for CQI requirements**

* Proposals
  + Option 1: Same Downlink model as agreed for PDSCH requirements (Apple, Current WF);
  + Option 2: Always schedule full slots in the LBT burst transmission for NR-U CQI testing (Huawei);
* Recommended WF:
  + For CQI requirements, used the same downlink model as agreed for PDSCH requirements

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| **Company** | **Comments** |
| MediaTek | There is a restriction for CQI test in Rel-15 that PDSCH is not scheduled on slots containing CSI-RS or slots which are not full DL.  If we do agree to follow the restriction, we cannot apply the current LBT burst transmission for PDSCH requirement for CQI testing. According the current WF, the resource for CSI-RS is allocated on slot 1 and there should be no PDSCH on slot 1, which violates the rule for the current downlink model for PDSCH. Besides, for DL Transmission duration larger than 2, the PDSCH allocation for the last slot should be full slot allocation, which also violates the rule for the current downlink model for PDSCH.  Hence, similar to issue 1-4-3, we think we need to determine first whether to follow the restriction for CQI test in Rel-15. |
| Qualcomm | On the comment from MediaTek, we do not see why the restriction used in Rel.15 CQI tests cannot be applied on top of the downlink model used for PDSCH tests.  A note can be added to the test assumption, that PDSCH is not scheduled on slots that contain CSI-RS or are not full DL. This implies that only when the last slot in the burst is full it will be scheduled with PDSCH.  Support option 1, adding the restrictions used in Rel.15 CQI tests. |
| Apple | Perhaps we need to schedule full slots for CQI test. The code rate would change if the number of symbols for PDSCH is different in the slot and we try to keep the same code rate in all slots for CQI tests. Also, we might need to make the minimum DL duration 3 slots. With 2 slot transmission, we would have PDSCH only in slot 1 and if that coincides with SSB transmission, that is also missed and there would be no PDSCH transmission. If we make it minimum of 3 slots we would always have PDSCH transmission when there is no LBT failure. |

**Issue 1-4-6: CQI requirements Simulation Parameters**

* Proposals
  + Option 1: Reuse licensed test parameters from CQI reporting test in static channel where applicable (Apple);
* Recommended WF:
  + TBA

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| **Company** | **Comments** |
| Qualcomm | Support Option 1. |
| Apple | We support Option 1 |
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**Issue 1-4-7: CQI requirements parameters: CQI Table**

* Proposals
  + Option 1: Use CQI Table 2 (Huawei, Qualcomm)
* Recommended WF:
  + Use CQI Table 2.

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| **Company** | **Comments** |
| MediaTek | Support the WF. |
| Qualcomm | Support the WF. |
| Apple | We support the WF. |

**Issue 1-4-8: CQI requirements parameters: Codebook Configuration**

* Proposals
  + Option 1: Reuse from Rel.15 CQI Tests (Huawei);
  + Option 2: CodebookSubsetRestriction = 010000 (Qualcomm, Ericsson)
* Recommended WF:
  + TBA

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| **Company** | **Comments** |
| MediaTek | Reuse CodebookSubsetRestriction = 010000 from Rel-15 CQI tests. |
| Qualcomm | Support Option 2 |
| Apple | Option 1 and 2 are the same. In Rel-15 the CodebookSubsetRestriction was 010000 for CQI tests in AWGN. |

### Sub-topic 1-5: CQI Performance Tests Requirements

**Issue 1-5-1: SNR pair to be used for requirements (not including Transmission Power Level Boost), 2 RX**

* Proposals
  + Option 1: [8,9] dB (Huawei, Qualcomm, Apple);
    - Option 1a: Same SNR as Test 1 for existing CQI reporting tests in static channel (Apple);
  + Option 2: [3,4] dB (Ericsson);
  + Option 3: [7,8] dB (Ericsson);
* Recommended WF
  + TBA

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| **Company** | **Comments** |
| Qualcomm | Support Option 1. |
| Apple | We support Option 1. |
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**Issue 1-5-2: SNR pair to be used for requirements (not including Transmission Power Level Boost), 4 RX**

* Proposals
  + Option 1: [5,6] dB (Huawei, Qualcomm, Apple);
    - Option 1b: Same SNR as Test 1 for existing CQI reporting tests in static channel (Apple);
* Recommended WF
  + TBA

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| **Company** | **Comments** |
| Qualcomm | Support Option 1. |
| Apple | We support option1 |
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**Issue 1-5-3: Minimum difference between Median CQI reported** **for different power level boost to be included in the requirements**

* Proposals
  + Option 1: 2 (Huawei, Apple, Qualcomm);
* Recommended WF
  + Define the minimum difference between Median CQI reported for different power level boost requirement equal to 2.

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| **Company** | **Comments** |
| Qualcomm | Support the WF. |
| Apple | We support the WF. |
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## Companies views’ collection for 1st round

### Open issues

*Companies are encouraged to comment in the dedicated comment section below each issue.*

### CRs/TPs comments collection

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| **CR/TP number** | **Comments collection** | |
| **Company** | **Comment** |
| **R4-2110938, MediaTek**  CR for TS38.101-4, PDSCH requirements for standalone NR-U | *Apple* | 1. *We need not specify TRS config as its same as that in common parameters.* 2. *Need not specify TX EVM* 3. *Number of tests is still TBD* 4. Number of additional DMRS: 1 |
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| **R4-2109355, Apple**  Draft CR NRU CQI Scenario A-R16 |  |  |
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| **R4-2109590, Ericsson**  Draft CR for TS38101-4 introduction of PDSCH demodulation requirements for NR-U Scenario A (catB)\_pa1 | Apple | We don’t think the requirements should be specified under interworking requirements. Section 5 would be more appropriate. |
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| **R4-2110501, Huawei**  Draft CR for TS 38.101-4 Introduction of fixed reference channel of NR-U PDSCH | Apple | We should add a note that there is no UL transmission in slot 9 and is idle slot. |
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| **R4-2110503, Huawei**  Draft CR for TS 38.101-4 Introduction of NR-U CQI requirements | Apple | The table for test parameters Table 6.1.2-1 is not from latest version of 38.101-4  We shouldn’t introduce new section for CQI reporting for unlicensed carrier. We should add requirements in section 6.2.  The requirements seem to cover both scenario A and scenario C. According to CR work split it should only be scenario C. We should have seprate sections for Scenario A and C  The wording in the section for requirements in Scenario C should be aligned with Scenario A.  Do we need a different measurement channel for unlicensed carrier? The CQI test is still for 1 layer as Rel-15 test.  These should be set as configured:  timeRestrictionForChannelMeasurements  timeRestrictionForInterferenceMeasurements |
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| **R4-2110719, Qualcomm**  DraftCR on NR-U UE Demodulation Downlink Transmission Model | Apple | Suggest using unlicensed carrier or shared spectrum access rather than NR-U in section title and text. |
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## Summary for 1st round

### Open issues

*Moderator tries to summarize discussion status for 1st round, list all the identified open issues and tentative agreements or candidate options and suggestion for 2nd round i.e. WF assignment.*

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|  | **Status summary** |
| **Sub-topic#1** | *Tentative agreements:*  *Candidate options:*  *Recommendations for 2nd round:* |

### CRs/TPs

*Moderator tries to summarize discussion status for 1st round and provided recommendation on CRs/TPs Status update suggestion*

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| **CR/TP number** | **CRs/TPs Status update recommendation** |
| XXX | *Based on 1st round of comments collection, moderator can recommend the next steps such as “agreeable”, “to be revised”* |

## Discussion on 2nd round (if applicable)

*Moderator can provide summary of 2nd round here. Note that recommended decisions on tdocs should be provided in the section titled ”Recommendations for Tdocs”.*

# Topic #4: PDSCH Simulation Results

## Companies’ contributions summary

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| **T-doc number** | **Company** | **Proposals / Observations** |
| R4-2109353 | Apple | PDSCH Simulation Results |
| R4-2109589 | Ericsson | PDSCH Simulation Results |
| R4-2110499 | Huawei | PDSCH Simulation Results |
| R4-2110767 | Qualcomm | PDSCH Simulation Results |
| R4-2110937 | MediaTek | PDSCH Simulation Results |
| R4-2110948 | Intel | PDSCH Simulation Results |

## Open issues summary

### Sub-topic 2-1: Simulation results for alignment

**Issue 2-1-1: Simulation results summary**

* Recommended WF

Companies are encouraged to fill their results in the summary document which will be shared via mail during the meeting (please see below in Section 5, **‘Existing TDocs’**).

## Companies views’ collection for 1st round

### Open issues

*Companies are encouraged to comment in the dedicated comment section below each issue.*

## Summary for 1st round

### Open issues

*Moderator tries to summarize discussion status for 1st round, list all the identified open issues and tentative agreements or candidate options and suggestion for 2nd round i.e. WF assignment.*

|  |  |
| --- | --- |
|  | **Status summary** |
| **Sub-topic#1** | *Tentative agreements:*  *Candidate options:*  *Recommendations for 2nd round:* |

### CRs/TPs

*Moderator tries to summarize discussion status for 1st round and provided recommendation on CRs/TPs Status update suggestion*

|  |  |
| --- | --- |
| **CR/TP number** | **CRs/TPs Status update recommendation** |
| XXX | *Based on 1st round of comments collection, moderator can recommend the next steps such as “agreeable”, “to be revised”* |

## Discussion on 2nd round (if applicable)

*Moderator can provide summary of 2nd round here. Note that recommended decisions on tdocs should be provided in the section titled ”Recommendations for Tdocs”.*

# Recommendations for Tdocs

## 1st round

**New tdocs**

|  |  |  |
| --- | --- | --- |
| **Title** | **Source** | **Comments** |
| WF on … | YYY |  |
| LS on … | ZZZ | To: RAN\_X; Cc: RAN\_Y |
|  |  |  |

**Existing tdocs**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Recommendation** | **Comments** |
| R4-2109351 | Summary of simulation results for NR-U UE Demod | Apple |  | Companies to fill their PDSCH results |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |

Notes:

1. Please include the summary of recommendations for all tdocs across all sub-topics incl. existing and new tdocs.
2. For the Recommendation column please include one of the following:
   1. CRs/TPs: Agreeable, Revised, Merged, Postponed, Not Pursued
   2. Other documents: Agreeable, Revised, Noted
3. For new LS documents, please include information on To/Cc WGs in the comments column
4. Do not include hyper-links in the documents

## 2nd round

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Recommendation** | **Comments** |
| R4-210xxxx | CR on … | XXX | Agreeable, Revised, Merged, Postponed, Not Pursued |  |
| R4-210xxxx | WF on … | YYY | Agreeable, Revised, Noted |  |
| R4-210xxxx | LS on … | ZZZ | Agreeable, Revised, Noted |  |
|  |  |  |  |  |

Notes:

1. Please include the summary of recommendations for all tdocs across all sub-topics.
2. For the Recommendation column please include one of the following:
   1. CRs/TPs: Agreeable, Revised, Merged, Postponed, Not Pursued
   2. Other documents: Agreeable, Revised, Noted
3. Do not include hyper-links in the documents