**3GPP TSG-RAN WG4 Meeting # 116 R4-2511477**

**Bangaluru, India, August 25th ‒ August 29th, 2025**

**Agenda item:** 7.27.1

**Source:** Moderator (Ericsson)

**Title:** Topic summary for [116][331] NR\_NTN\_Ph3\_demod

**Document for:** Information

# Introduction

This topic summary summarizes the issues on SAN and UE demodulation requirements for Rel-19 WI NTN for NR Phase 3 WI (RP-243300), which contains the following objectives:

* Uplink capacity/cell throughput enhancements
* Support of Rel-17 RedCap and Rel-18 eRedCap UEs

References:

R4-2508755, “Way Forward for [115][333] NR\_NTN\_Ph3\_demod”, Ericsson, RAN4#115.

# Topic #1: SAN demodulation requirements

This topic discusses the SAN demodulation requirements.

## Companies’ contributions summary

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| **T-doc number** | **Company** | **Proposals / Observations** |
| R4-2509110 | Nokia | **Observation 1:** The WID indicates at least 2 and 4 should be defined for OCC inter-slot length**Proposal 1:** RAN4 shall define PUSCH requirements with inter-slot OCC length 4**Proposal 2:** RAN4 shall use SCS=15KHz with 5MHz CBW and SCS=30KHz with 10MHz CBW**Proposal 3:** RAN4 shall use NTN-TLDA100-200 Low for all cases**Observation 2:** It could be appropriate to use either 200Hz Frequency offset or none**Proposal 4:** RAN4 may use 200 Hz Frequency offset**Proposal 5:** RAN4 shall use MCS4 for all cases**Proposal 6:** RAN4 shall use both 1Rx and 2Rx for PUSCH requirements |
| R4-2509398 | Samsung | SAN demodulation requirements**Proposal 1:** Only consider OCC length as 2 for specifying PUSCH requirement with OCC **Proposal 2:** Consider one OCC group, and number of repetitions with 2 as starting point, the initial RV can be configured as 0. FFS on considering two OCC groups with number of repetitions as 4 to verify the RV cycling function across OCC groups, the initial RV value for two OCC group 0, 2**Proposal 3:** Only consider the minimum number of channel bandwidth for each SCS for specifying PUSCH requirement with OCC* 15KHz, 5MHz
* 30KHz, 10MHz

**Proposal 4:** Configure the same frequency offset as 0Hz for two UEs.**Proposal 5:** Select the channel model with NTN-TDLC5-200 for specifying PUSCH requirement with OCC feature.**Proposal 6:** Configure the MCS 5 in MCS index table 2 (Table 6.1.4.1-2) without considering pi2BSK to specify the PUSCH requirement with inter-slot OCC**Proposal 7:** Configure the DMRS port {0} for UE 0, and port {1} for UE 1, Disable frequency and sequence hopping and configure the group number u and sequence number v as 0 for DMRS sequence generation. **Proposal 8:** RAN4 apply the 1% of BLER as test metric for specifying PUSCH requirement with inter-slot OCC feature per each UE.**Proposal 9:** Introduce NR NTN PUSCH requirement with inter-slot OCC feature for both mapping type A and type B, and apply the same test applicability rule of existing NTN PUSCH requirements to test.**Proposal 10:** Assuming the similar receiving power for two UEs at gNB side for specifying the PUSCH requirement with inter-slot OCC feature.**Proposal 11:** Considering the existing test parameters for PUSCH with DFT-s-OFDM waveform requirement as reference. **Observation 1:** Compared with single UE without OCC, there is a minor performance degradation with OCC operation, assuming the same frequency offset for two UEs**Observation 2:** Assuming different frequency offset for two UEs, about 1 dB performance degradation can be observed. |
| R4-2510397 | Ericsson | **Observation 1:** RAN4 SAN Demodulation should wait for the conclusion of phase continuity and power consistency discussions in RAN4 RF.**Observation 2:** For PUSCH OCC, it is better to model the phase continuity tolerance of UE and the carrier frequency offset for the minimum performance requirement to check receiver algorithm if it is feasible for TE implementation. **Observation 3:** As per our initial simulations, it was seen that OCC performance is sensitive to the Doppler shift with non-LoS (line of sight) channel model, but not much in LoS channel model.**Observation 4:** In the low SNR region, there is not much impact with Doppler shift. However, LoS channel model provides a better performance than non-LoS channel.**Proposal 1:** Consider only OCC-length 2 to define Rel-19 SAN PUSCH demodulation requirements.**Proposal 2:** Consider minimum channel bandwidth per sub-carrier spacing, i.e.15KHz, 5MHz and 30KHz, 10MHz.**Proposal 3:** For the simulations and minimum requirement, we only consider the FDD mode. **Proposal 4:** Consider 1Tx with 1/2 Rx antenna configuration for defining the SAN PUSCH demodulation requirements with OCC.**Proposal 5:** Consider same channel model for multiple UEs for SAN PUSCH requirements with OCC.**Proposal 6:** Consider both ‘NTN-TDLA100-200 Low’ and ‘NTN-TDLC5-200 Low’ channel models for initial simulations for SAN PUSCH requirements with OCC with further down selection.**Proposal 7:** Consider MCS 4 and 5 as a starting point. However, the decision of MCS depends on the agreement of the channel model.**Proposal 8:** For initial simulations, we prefer to consider only one OCC group, with RV value configured as 0.**Proposal 9:** For starting point, consider PUSCH aggregation factor as n2 for simulations with SAN PUSCH OCC requirements.**Proposal 10:** For initial simulations, take both ideal and worse-case scenario for CFO, i.e. 0 Hz and 0.1ppm which is typically used for RAN4 requirement.**Proposal 11:** Only consider DMRS configuration type 1 for SAN PUSCH requirements with OCC.**Proposal 12:** Consider OCC sequence index as {0,1} as the starting point for initial simulations.**Proposal 13:** Evaluate UE performance multiplexed with OCC sequence [1, -1] to verify correct baseband implementation of the OCC sequence in testing. **Proposal 14:** Consider DMRS ports {0,1} as the starting point for initial simulations.**Proposal 15:** Choose nSCID=0 and N0ID=0 for DMRS sequence generation for SAN PUSCH requirements for OCC.**Proposal 16:** Use Additional DMRS position as ‘pos1’ for SAN PUSCH requirements for OCC.**Proposal 17:** Do not consider frequency hopping for SAN PUSCH requirements with OCC.**Proposal 18:** Consider SNR@70% normalized throughput as the test metric to define the requirements. |
| R4-2510869 | Huawei, HiSilicon | **Proposal 5:** Only consider inter-slot OCC length 2.**Proposal 6:** Only consider same frequency offset for two UEs in one OCC group, 0.1 ppm frequency offset can be regard as the baseline.**Proposal 7:** For the other parameters, the Table 8.2.2.1-1 in TS 38.104 can be reused unless otherwise stated. |
| R4-2510398 | Ericsson | Simulation results for SAN demodulation requirements. |

## Open issues summary

RAN4#115 agreed to define SAN PUSCH demodulation requirements for DFT-s-OFDM with orthogonal cover codes. It was agreed to apply inter-lost OCC length 2 to PUSCH type A repetition, but it was not decided whether to apply

RAN4#116 will focus on:

* Whether to define PUSCH demodulation requirements with OCC length 4 or not, and
* The detailed test setup.

### Sub-topic 1-1 PUSCH requirement with OCC length 4

**Issue 1-1-1: Define PUSCH demodulation requirements with OCC length 4 or not**

* Proposals
	+ Option 1: Define PUSCH demodulation requirements with inter-slot OCC length 4. (Nokia)
	+ Option 2: Not define PUSCH demodulation requirements with inter-slot OCC length 4. (Samsung, Ericsson, Huawei, HiSilicon)
		- Consider only OCC length 2 to define PUSCH demodulation requirements.
* Recommended WF
	+ Need discussion.

### Sub-topic 1-2 Test setup for OCC length 2

**Issue 1-2-1: OCC group configuration**

* Proposals
	+ Consider one OCC group with aggregation factor 2, initial RV configured as 0. (Samsung, Ericsson)
		- FFS considering two OCC groups with aggregation factor 4, with the RV cycling across OCC groups, the initial RV value for two OCC group 0, 2 (Samsung)
* Recommended WF
	+ Consider one OCC group with aggregation factor 2, initial RV configured as 0.
	+ Interested companies can provide simulation results with two OCC groups with aggregation factor 4, with RV cycling.

**Issue 1-2-2: SCS/CBW**

* Proposals
	+ 15kHz/5MHz and 30kHz/10MHz (Samsung, Nokia, Ericsson)
		- FDD only (Ericsson)
* Recommended WF
	+ FDD 15kHz/5MHz
	+ FDD 30kHz/10MHz.

**Issue 1-2-3: Frequency offset of two multiplexed UEs.**

* Proposals
	+ Option 1: Same frequency offset as 0Hz for two UEs (Samsung)
	+ Option 2: 200Hz (Nokia)
	+ Option 3: Same frequency offset for two UEs. Consider 0.1ppm as the baseline (Huawei)
	+ Option 2: 0Hz and 0.1ppm (Ericsson)
* Recommended WF
	+ Moderator understands companies consider setting the same frequency offset for two UEs.
	+ Set the same frequency offset for two UEs.
		- Discuss 0Hz or 200Hz (0.1ppm@2GHz)

**Issue 1-2-4: Channel model**

* Proposals
	+ Apply the same channel model to the multiplex UEs (Ericsson)
		- Option 1: NTN-TDLC5-200 (Samsung, Ericsson)
		- Option 2: NTN-TDLA100-200 (Nokia, Ericsson)
		- Ericsson: Consider both the channel models for initial simulation. Down-select later.
* Recommended WF
	+ Apply the same channel model to the multiplex UEs.
	+ Discuss the applied channel model.

**Issue 1-2-5: MCS**

* Proposals
	+ Option 1: MCS5 (Samsung, Ericsson)
	+ Option 2: MCS4 (Nokia. Ericsson)
	+ Ericsson: Consider both the MCSs for initial simulation. Down-select later
* Recommended WF
	+ Need discussion.

**Issue 1-2-6: DMRS configuration**

* Proposals
	+ Configure DMRS configuration type 1 (Ericsson)
	+ Assign DMRS port 0 for UE0 and DMRS port 1 for UE1. (Samsing, Ericsson)
		- Set OCC sequence index to 0 and 1 (Ericsson)
	+ Disable frequency and sequence hopping (Samsung, Ericsson)
	+ Configure the group number u and sequence number v as 0 for DMRS sequence generation (Samsung)
	+ Set $n\_{SCID}=0$, Set $N\_{ID}^{0}=0$, for DMRS sequence generation (Ericsson)
	+ Set additional DMRS position as ‘pos1’ (Ericsson)
* Recommended WF
	+ Check whether the proposals are agreed.

**Issue 1-2-7: Test metric**

* Proposals
	+ Option 1: SNR at 1% PUSCH BLER (Samsing)
	+ Option 2: SNR at 70% of maximum throughput (Ericsson)
		- Measure the PUSCH throughput from UE with OCC sequence [1, -1].
* Recommended WF
	+ Need discussion.

**Issue 1-2-8: PUSCH mapping type**

* Proposals
	+ Both mapping type A and B (Samsung)
		- Apply the same test applicability rule of existing NTN PUSCH requirements
* Recommended WF
	+ Moderator: TS 38.104 Table 8.2.2.1-1 configures both PUSCH mapping type A and B.
	+ Discuss whether the proposal is agreed or not.

**Issue 1-2-9: Received signal power**

* Proposals
	+ Assuming the similar receiving power for two UEs at gNB side (Samsung)
* Recommended WF
	+ Check whether the proposals are agreed.

**Issue 1-2-10: Antenna configuration**

* Proposals
	+ Both 1Rx and 2Rx (Nokia, Ericsson)
	+ 1Tx (Ericsson)
* Recommended WF
	+ 1Tx – 1Rx
	+ 1Tx – 2Rx

**Issue 1-2-11: Other parameters**

* Proposals
	+ Option 1: Reuse the existing PUSCH demodulation requirements with DFT-s-OFDM (Samsung, Huawei).
		- Reuse test parameters in TS 38.104 Table 8.2.2.1-1 (Huawei)
* Recommended WF
	+ Reuse the test parameters in TS 38.104 Table 8.2.2.1-1 unless otherwise.

# Topic #2: UE demodulation requirements

This topic discusses the UE demodulation requirements.

## Companies’ contributions summary

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| **T-doc number** | **Company** | **Proposals / Observations** |
| R4-2509110 | Nokia | **Proposal 7:** RAN4 shall Reuse Rel-17 NTN PDSCH demodulation requirements without BW reduction for eRedCap |
| R4-2509169 | MediaTek inc. | **Proposal 1:** Define PDSCH demodulation requirements for RedCap UEs with NR NTN operating FR1-NTN bands.**Proposal 2:** Define a new HD-FDD reference channel for Modulation format and code rate “QPSK, 0.30” and 52PRBs.**Proposal 3:** Define PDSCH demodulation requirements for eRedCap UEs with NR NTN operating FR1-NTN bands.**Proposal 4:** For reference channel, reuse R.PDSCH.1-25.1 FDD and R.PDSCH.1-2.3 HD-FDD in TS38.101-4 for NR NTN eRedCap UEs with reduced bandwidth.**Proposal 5:** We propose first reaching consensus on the detailed NR NTN RedCap/eRedCap configurations and awaiting the outcomes of the WI NR\_IoT\_NTN\_req\_test\_enh performance evaluation to determine whether to apply the time-varying Doppler shift and propagation delay model for NGSO. |
| R4-2509489 | Apple | **Observation 1:** Rel-17 NTN features for NTN are applicable to RedCap/eRedCap UEs supporting non-terrestrial access.**Proposal 1:** Confirm agreement in RAN4#115 to reuse Rel-17 NTN PDSCH requirements for 2RX RedCap UE.**Proposal 2:** Define requirements for 1RX RedCap and eRedCap UEs to have requirements coverage for all categories of UEs.**Observation 2:** The proposed simulation effort in Rel-19 for RedCap NTN – 4 TCs with 1RX.**Proposal 3:** Reuse the existing 2RX Rel-17 NTN test cases for 1RX requirements for RedCap NTN.**Proposal 4:** Additional test cases for RedCap NTN with 1RX:**Observation 3:** The proposed simulation effort in Rel-19 for eRedCap NTN – 4 TCs with 1RX and 4 TCs with 2RX.**Proposal 5:** Test cases for 2RX and 1RX requirements for eRedCap NTN |
| R4-2510397 | Ericsson | **Proposal 19:** Define new PDSCH requirements with NTN channel model for Rel-17 RedCap 1Rx UE.**Proposal 20:** For eRedCap UEs, to add new PDSCH requirements with BB BW reduction with NTN channel for 1Rx and 2Rx UEs.**Proposal 21:** Define new reference channel for HD-FDD (e)RedCap with the same performance requirements as for FDD.**Proposal 22:** Define new PDSCH demodulation requirements with the following test setup:* Test cases of PDSCH for RedCap 1Rx
	+ MCS4, NTN-TDLA100-200, 1x1, Disabled HARQ
	+ MCS13, NTN-TDLC5-200, 1x1, 16 HARQ processes
	+ MCS4, NTN-TDLA100-200, 1x1, 32 HARQ processes
* Test cases of PDSCH for eRedCap 1Rx and 2Rx
	+ MCS4, NTN-TDLA100-200, 1x1, with reduced BB BW (25RB), Disabled HARQ
	+ MCS13, NTN-TDLC5-200, 1x1, with reduced BB BW (25RB), 16 HARQ processes
	+ MCS4, NTN-TDLC5-200, 1x1, with reduced BB BW (25RB), 32 HARQ processes

**Proposal 23:** Open to consider applying the NGSO model for Rel-19 NTN enhancement requirements to (e)RedCap UE PDSCH demodulation requirements. |
| R4-2510869 | Huawei, HiSilicon | **Proposal 1:** For RedCap 1Rx UE, use the same test configurations as the existing Rel-17 NTN PDSCH cases.* MCS4, NTN-TDL A100-200, 1x1, 16 HARQ processes
* MCS13, NTN-TDLC5-200, 1x1, 16 HARQ processes
* MCS4, NTN-TDLC5-200, 1x1, 32 HARQ processes
* MCS4, NTN-TDLA100-200, 1x1, Disabled HARQ

**Proposal 2:** For eRedCap 1Rx UE, define following cases with test applicability rule for Cases for MCS 13 with 16 HARQ processes with and without reduced BB BW, i.e. If UE pass the case without reduced BB BW, the case with reduced BB BW can be skipped.* MCS4, NTN-TDL A100-200, 1x1, with reduced BB BW (25RB), 16 HARQ processes
* MCS13, NTN-TDLC5-200, 1x1, with reduced BB BW (25RB), 16 HARQ processes
* MCS4, NTN-TDLC5-200, 1x1, with reduced BB BW (25RB), 32 HARQ processes
* MCS4, NTN-TDLA100-200, 1x1, with reduced BB BW (25RB), Disabled HARQ
* MCS13, NTN-TDLC5-200, 1x1, without reduced BB BW (40RBs), 16 HARQ processes

**Proposal 3:** For eRedCap 2Rx UE, define following cases with the same test applicability rule as stated in Proposal 2.* MCS4, NTN-TDL A100-200, 1x1, with reduced BB BW (25RB), 16 HARQ processes
* MCS13, NTN-TDLC5-200, 1x1, with reduced BB BW (25RB), 16 HARQ processes
* MCS4, NTN-TDLC5-200, 1x1, with reduced BB BW (25RB), 32 HARQ processes
* MCS4, NTN-TDLA100-200, 1x1, with reduced BB BW (25RB), Disabled HARQ
* MCS13, NTN-TDLC5-200, 1x1, without reduced BB BW (40RBs), 16 HARQ processes

**Proposal 4:** Not apply the time-varying Doppler shift and propagation delay model for NGSO to (e)RedCap demodulation requirements in Rel-19. |
| R4-2511596 | QUALCOMM Europe Inc. | **Proposal 1:** When reusing NTN requirements for RedCap UEs with 2Rx, the impact of the number of HARQ processes should be considered.**Proposal 2:** Evaluate PDSCH requirements using NTN channel models for 1Rx RedCap UEs.**Observation 1:** Limit the evaluation of 1Rx RedCap UEs to mandatory features, such as only considering 16 HARQ processes, to reduce test complexity.**Proposal 3:** Support option 1 with MCS13, NTN-TDLC5-200, 1x1, 16 HARQ processes.**Proposal 4:** Support option 1 for 2Rx UE (Add new PDSCH requirements with BW reduction i.e., 25RB with NTN channel).**Proposal 5:** Evaluate PDSCH requirements using NTN channel models for 1Rx eRedCap UEs.**Proposal 6:** Support option 1 (Define new reference channel for HD-FDD (e)RedCap with the same performance requirements as for FDD).**Proposal 7:** The following test cases to be considered for eRedCap UEs:* MCS13, NTN-TDLC5-200, 1x1, with reduced BB BW (25RB), 16 HARQ processes for 1Rx eRedCap UE.
* MCS13, NTN-TDLC5-200, 1x2, with reduced BB BW (25RB), 16 HARQ processes 2Rx eRedCap UE.

**Proposal 8:** Further discuss the feasibility of considering Rel-19 channel model for NGSO scenarios in the context of redcap/eRedCap UEs. |

## Open issues summary

RAN4#115 agreed to define PDSCH demodulation requirements for RedCap/eRedCap under NTN scenario.

RAN4#115 agreed to Rel-17 2Rx PDSCH demodulation requirements for NTN are applicable for RedCap 2Rx UE.

RAN4#116 will focus on:

* Test setup of the PDSCH demodulation requirements for RedCap 1Rx UE with NTN, and
* Test setup of the PDSCH demodulation requirements for eRedCap 1Rx/2Rx UE with NTN.

### Sub-topic 2-1 RedCap demodulation for NTN

**Issue 2-1-1: RedCap 1Tx-1Rx, 10MHz/15kHz, FDD/HD-FDD**

* Proposals
	+ Option 1 (MediaTek):
		- MCS4 (QPSK, 0.30), 52PRB, NTN-TDLA100-200, 16 HARQ process.
		- MCS13 (16QAM 0.48), 52PRB, NTN-TDLC5-200, 16 HARQ process.
	+ Option 2 (Apple, Huawei, HiSilicon):
		- MCS4 (QPSK, 0.30), 52PRB, NTN-TDLA100-200, 16 HARQ process.
		- MCS13 (16QAM 0.48), 52PRB, NTN-TDLC5-200, 16 HARQ process.
		- MCS4 (QPSK, 0.30), 52PRB, NTN-TDLC5-200, 32 HARQ process.
		- MCS4 (QPSK 0.30), 52PRB, NTN-TDLA100-200, Disabled HARQ.
	+ Option 3 (Ericsson):
		- MCS4 (QPSK, 0.30), 52PRB, NTN-TDLA100-200, Disabled HARQ.
		- MCS13 (16QAM 0.48), 52PRB, NTN-TDLC5-200, 16 HARQ process.
		- MCS4 (QPSK, 0.30), 52PRB, NTN-TDLA100-200, 32 HARQ process.
	+ Option 4 (Qualcomm):
		- MCS13 (16QAM 0.48), 52PRB, NTN-TDLC5-200, 16 HARQ process.
* Consolidated proposals

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| **MCS/PRB** | **Channel model** | **HARQ process** | **Supporting companies** |
| MCS4, 52PRB | NTN-TDLA100-200 | 16 | MediaTek, Apple, Huawei, HiSilicon, Ericsson |
| MCS4, 52PRB | NTN-TDLC5-200 | 32 | Apple, Huawei, HiSilicon |
| MCS4, 52PRB | NTN-TDLA100-200 | 32 | Ericsson |
| MCS4, 52PRB | NTN-TDLA100-200 | Disabled | Apple, Huawei, HiSilicon |
| MCS13, 52PRB | NTN-TDLC5-200 | 16 | MediaTek, Apple, Huawei, HiSilicon. Ericsson, Qualcomm |

* Recommended WF
	+ Define PDSCH demodulation requirements at least with MCS13, NTN-TDLC5-200, 16 HARQ process.
	+ Another candidate: MCS13, NTN-TDLA100-200, 16 HARQ process
	+ Discuss further:
		- MCS4, NTN-TDLC5-200 or NTN-TDLA100-200, 32 HARQ process.
		- MCS4, NTN-TDLA100-200, HARQ disabled.

**Issue 2-1-2: FRC for HD-FDD RedCap demodulation**

* Proposals (MediaTek)
	+ Reuse “R.PDSCH.1-1.2 HD-FDD” in TS38.101-4 for “16QAM, 0.48” test.
	+ Define a new HD-FDD reference channel for MCS4 and 52PRB.
		- Moderator: R.PDSCH.1-1.1 HD-FDD in TS 38.101-3 configures 18 DM-RS REs. MediaTek proposes to configure 12 DM-RS REs (1+1) instead of 18 REs (1+1+1).
* Recommended WF
	+ Discuss the proposal.

### Sub-topic 2-2 eRedCap demodulation for NTN

**Issue 2-2-1: eRedCap 1Rx and 2Rx**

Moderator: It is observed all the companies propose to apply the same test setup for both eRedCap 1Rx and 2Rx UEs.

* Recommended WF
	+ Apply the same PDSCH demodulation test setup for eRedCap 1Rx and 2Rx UEs.

**Issue 2-2-1: eRedCap 1Tx-1Rx/2Rx, 10MHz/15kHz, FDD/HD-FDD**

* Proposals
	+ Option 1 (Nokia): Reuse Rel-17 NTN PDSCH demodulation requirements without BW reduction
	+ Option 2 (MediaTek):
		- MCS4 (QPSK 0.30), 52PRB, NTN-TDLA100-200, 16 HARQ process, without BW reduction (Same as RedCap)
		- MCS13 (16QAM 0.48), 25PRB, NTN-TDLC5-200, 16 HARQ process, BW reduction
	+ Option 3 (Apple):
		- MCS4 (QPSK 0.30), 52PRB, NTN-TDLC5-200, 32 HARQ process, without BW reduction
		- MCS4 (QPSK 0.30), 52PRB, NTN-TDLA100-200, Disabled HARQ, without BW reduction
		- MCS13 (16QAM 0.48), 40PRB, NTN-TDLA100-200, 16 HARQ process, without BW reduction
		- MCS4 (QPSK 0.30), 25PRB, NTN-TDLA100-200, Disabled HARQ, BW reduction
		- MCS13 (16QAM 0.48), 25PRB, NTN-TDLC5-200, 16 HARQ process, BW reduction
		- MCS4 (QPSK 0.30), 25PRB, NTN-TDLC5-200, 32 HARQ process, BW reduction
	+ Option 4 (Ericsson):
		- MCS4 (QPSK, 0.30), 25PRB, NTN-TDLA100-200, Disabled HARQ, BW reduction
		- MCS13 (16QAM 0.48), 25PRB, NTN-TDLC5-200, 16 HARQ process, BW reduction
		- MCS4 (QPSK, 0.30), 25PRB, NTN-TDLA100-200, 32 HARQ process, BW reduction
	+ Option 3 (Huawei, HiSilicon):
		- MCS4 (QPSK 0.30), 25PRB, NTN-TDLA100-200, 16 HARQ process, BW reduction
		- MCS13 (16QAM 0.48), 25PRB, NTN-TDLC5-200, 16 HARQ process, BW reduction
		- MCS4 (QPSK 0.30), 25PRB, NTN-TDLC5-200, 32 HARQ process, BW reduction
		- MCS4 (QPSK 0.30), 25PRB, NTN-TDLA100-200, HARQ Disabled, BW reduction
		- MCS13 (16QAM 0.48), 40PRB, NTN-TDLC5-200, 16 HARQ process, without BW reduction
	+ Option 4 (Qualcomm):
		- MCS13 (16QAM 0.48), 25PRB, NTN-TDLC5-200, 16 HARQ process, BW reduction
* Consolidated proposals **without** baseband BW reduction

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| **MCS/PRB** | **Channel model** | **HARQ process** | **Supporting companies** |
| MCS4, 52 | NTN-TDLA100-200 | 16 | MediaTek |
| MCS4, 52 | NTN-TDLC5-200 | 32 | Apple |
| MCS4, 52 | NTN-TDLA100-200 | Disabled | Apple |
| MCS13, 40 | NTN-TDLA100-200 | 16 | Apple |
| MCS13, 40 | NTN-TDLC5-200 | 16 | Huawei, HiSilicon |

* Consolidated proposals **with** baseband BW reduction

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| **MCS/PRB** | **Channel model** | **HARQ process** | **Supporting companies** |
| MCS4, 25 | NTN-TDLA100-200 | Disabled | Apple, Ericsson, Huawei, HiSilicon |
| MCS4, 25 | NTN-TDLA100-200 | 16 | Huawei, HiSilicon |
| MCS4, 25 | NTN-TDLC5-200 | 32 | Apple, Huawei, HiSilicon |
| MCS4, 25 | NTN-TDLA100-200 | 32 | Ericsson |
| MCS13, 25 | NTN-TDLC5-200 | 16 | MediaTek, Apple, Ericsson, Huawei, HiSilicon, Qualcomm |

* Recommended WF
	+ For With BB BW reduction eRedCap UE,
		- Define at least with MCS13, 25PRB, NTN-TDLC5-200, 16 HARQ.
		- Another candidate: MCS4, 25PRB, NTN-TDLA100-200, HARQ disabled
		- Discuss other options further.
	+ For Without BB BW reduction eRedCap UE,
		- Discuss options.

**Issue 2-2-3: FRC for eRedCap demodulation**

* Proposals (MediaTek)
	+ Reuse R.PDSCH.1-25.1 FDD and R.PDSCH.1-2.3 HD-FDD in TS38.101-4 for NR NTN eRedCap UEs with reduced bandwidth
* Recommended WF
	+ Depending on the conclusion of Issues 2-2-1.

**Issue 2-2-5: Applicability rule between With/Without BB BW reduction requirements**

* Proposals (Huawei, HiSilicon)
	+ If eRedCap UE pass the case without reduced BB BW, the case with reduced BB BW can be skipped.
* Recommended WF
	+ Postpone the discussion. Depending on the conclusion of Issue 2-2-1.

### Sub-topic 2-3 Others

**Issue 2-3-1: Applicability of time-varying Doppler shift and time-varying channel model to NTN RedCap/eRedCap demodulation requirements.**

* Proposals
	+ Option 1: Not to apply the time-varying Doppler shift and propagation delay model for NGSO to (e)RedCap demodulation requirements in Rel-19. (Huawei)
	+ Option 2: Wait for the outcomes of the WI NR\_IoT\_NTN\_req\_test\_enh performance evaluation (MediaTek).
	+ Option 3: Option to consider applying the NGSO model for Rel-19 NTN enhancement requirements to (e)RedCap UE PDSCH demodulation requirements. (Ericsson)
	+ Option 4: Further discuss the feasibility of considering Rel-19 channel model for NGSO scenarios in the context of redcap/eRedCap UEs. (Qualcomm)
* Recommended WF
	+ Early to decide whether to apply Rel-19 time-varying Doppler shift and time-varying channel model to NTN RedCap/eRedCap demodulation requirements.
	+ Postpone the discussion until WI NR\_IoT\_NTN\_req\_test\_enh is completed.