**3GPP TSG-RAN WG4 Meeting #111 R4-24xxxxx**

**Fukuoka, Japan, 20 - 24 May, 2024**

**Agenda item:** 7.16.9

**Source:** Moderator (Huawei, HiSilicon)

**Title:** Topic summary for [111][325] NR\_NTN\_enh\_SAN\_UE\_demod

**Document for:** Information

# Introduction

This contribution summarises the open issues for NR\_NTN\_enh\_SAN\_UE\_demod under AI 7.16.8 at RAN4#111.

This topic is introduced in RAN4 demodulation at RAN4#108b with a completion by RAN#104 in June 2024.

Three topics are captured:

* Topic #1: UE demodulation performance requirements
* Topic #2: SAN demodulation performance requirements
* Topic #3: CR list
* Topic #2: Documents and suggested status

# Topic #1: UE demodulation performance requirements

## Companies’ contributions summary

|  |  |  |
| --- | --- | --- |
| **T-doc number** | **Company** | **Proposals / Observations** |
| [R4-2407143](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_111/Docs/R4-2407143.zip) | Nokia | Supporting Simulations for NR NTN UE Demodulation |
| [R4-2407144](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_111/Docs/R4-2407144.zip) | Nokia | Proposal 1: RAN4 shall not include power class explicitly in NTN-FR2 radiated requirements as this is implicitly implied  Proposal 2: RAN4 to discuss the structure of the general sections of the radiated requirements of TS 38.101-5 before submission of the bigCR.  Observation 1: The FRC annex numbering on NTN specifications does not align with those of the TN specifications.  Proposal 3: RAN4 to discuss whether TN and NTN FRCs should aim to be aligned. |
| [R4-2407251](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_111/Docs/R4-2407251.zip) | Apple | Simulation results for FR2 NTN UE demodulation |
| [R4-2408678](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_111/Docs/R4-2408678.zip) | Qualcomm India Pvt Ltd | Observation 1: The one-way delay between satellite-UE is about 129sec for GSO scenarios at 30 deg elevation angle.  Observation 2: The K\_offset value should be twice of one-way delay between satellite-UE.  Proposal 1: Consider a K\_offset value of 258sec or 2064 slots for GSO scenarios.  Proposal 2: Consider PTRS configuration with K=2 and L=1 for simulation assumptions. |
| [R4-2408679](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_111/Docs/R4-2408679.zip) | Qualcomm India Pvt Ltd | Simulation results for NR NTN enhancements |
| [R4-2408746](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_111/Docs/R4-2408746.zip) | Ericsson | Proposal 1: Use 132 for the CORESET RB of PDCCH test cases  Proposal 2: Use 42 bits for the payload of PDCCH test cases |
| [R4-2408747](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_111/Docs/R4-2408747.zip) | Ericsson | Simulation results for NR NTN enhancement UE demodulation |
| [R4-2408975](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_111/Docs/R4-2408975.zip) | Huawei,HiSilicon | Proposal 1: Do not configure PTRS for all PDSCH demodulation requirements for above 10 GHz bands.  Proposal 2: Use CORESET RB = 132 and CORESET duration = 1 for PDCCH demodulation requirements for above 10 GHz bands.  Proposal 3: For the case 1 with the DCI format 1\_0, use the payload size = 42. |
| [R4-2408976](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_111/Docs/R4-2408976.zip) | Huawei,HiSilicon | Simulation results for NR NTN enhancements UE demodulation requirements |
| R4-2408978 | Huawei,HiSilicon | Simulation results summary on demodulation requirements for NR NTN enhancements |
| R4-2408977 | Huawei,HiSilicon | Updated Simulation assumption on demodulation requirements for NR NTN enhancements |

## Open issues summary

### Sub-topic 1-1: General issues for above 10 GHz bands

**Issue 1-1-1: Power class**

* Proposals
  + Option 1 (Nokia): RAN4 shall not include power class explicitly in NTN-FR2 radiated requirements as this is implicitly implied
* Recommended WF
  + Moderator observations:
    - In section 6.2.1 of TS 38.101-5, for FR1-NTN, only UE power class 3 is defined.
    - In section 9.2.1 of TS 38.101-5, for FR2-NTN, different UE types are specified, i.e. UE Type 1~5, the demodulation requirements to be defined should be applicable for all FR2 NTN UE Types.
    - UE Types instead of power class should be included for FR2-NTN radiated performance requirements.
  + Suggested WF: include FR2-NTN UE Type 1~5 for radiated requirements.

**Issue 1-1-2: Clarification on TS 38.101-5 structure for radiated requirements**

* Proposals
  + Option 1 (Nokia): RAN4 to discuss the structure of the general sections of the radiated requirements of TS 38.101-5 before submission of the bigCR.
* Recommended WF
  + Moderator observation:
    - The general section structure for FR2 TN radiated demodulation performance requirements in TS 38.101-4 is as following:

|  |
| --- |
| 4 General  4.1 Relationship between minimum requirements and test requirements  4.2 Applicability of minimum requirements  4.5 Radiated requirements  4.5.0 Introduction  4.5.1 Reference point  4.5.2 SNR definition  4.5.3 Noc  4.5.4 Angle of arrival  4.5.5 Es  ......  7 Demodulation performance requirements (Radiated requirements)  7.1 General  7.1.1 Applicability of requirements  7.1.1.1 General  7.1.1.2 Applicability of requirements for different number of RX antenna ports  7.1.1.3 Applicability of requirements for optional UE features  7.1.1.4 Applicability of requirements for mandatory UE features with capability signalling  ……  7.2 PDSCH demodulation requirements  7.2.1 1RX requirements  7.2.2 2RX requirements |

* + - The general section structure for FR1-NTN conducted performance requirements in TS 38.101-5 is as following:

|  |
| --- |
| 8 Conducted performance requirements  8.1 General  8.1.1 Relationship between minimum requirements and test requirements  8.1.2 Applicability of minimum requirements  8.1.3 Conducted requirements  8.1.3.1 Introduction  8.1.3.2 Reference point  8.1.3.3 SNR definition  8.1.3.4 Noc  8.2 Demodulation performance requirements  8.2.1 General  8.2.1.1 Applicability of requirements  8.2.1.1.1 General  8.2.1.1.2 Applicability of requirements for optional UE features  8.2.1.2 PDSCH demodulation requirements  8.2.1.2.1 1RX requirements  8.2.1.2.2 2RX requirements |

* + - TS 38.101-5 include both RF and demodulation requirements for NTN, but TS 38.101-4 only includes demodulation requirements for TN. So, the TN general section 4 related as yellow highlighted is included in general section 8.1 for NTN conducted performance requirements. Similarly, TN general section 4.5 related should be included in general section 11.1 for NTN radiated performance requirements.
  + Suggested WF: Follow the specification structure of section 8.1 for FR1-NTN in TS 38.101-5 for FR2-NTN performance requirements

**Issue 1-1-3: FRC Alignment with TN Specs**

* Proposals
  + Option 1 (Nokia): RAN4 to discuss whether TN and NTN FRCs should aim to be aligned.
* Recommended WF
  + Further discuss is needed.
  + Moderator observation:
    - RAN4 discussed the FRC numbering alignment among specifications TS 38.104, TS 38.141-1 and TS 38.141-2 for gNB performance requirements
    - RAN4 is discussing the FRC numbering alignment among specifications TS 38.106, TS 38.115-1 and TS 38.115-2 for NCR performance requirements
    - Usually RAN4 align the FRC numbering for the same device types, such as TN, NCR or NTN, but in different specifications for core part, conducted requirements and radiated requirements.
    - The requirements defined for TN and NTN are based on different test parameters and for different device types for FR2-NTN, no strong necessity to align the FRC between them.
  + Suggested WF: No need to align the FRC numbering between TN and NTN FRCs.
    1. Sub-topic 1-2: PDSCH requirements for above 10 GHz bands

**Issue 1-2-1: K\_offset value for GSO scenarios**

* Agreement in previous meeting (R4-2406024, RAN4#110b)

|  |
| --- |
| * + *Define one set of performance requirements for both NGSO and GSO*     - *Only consider K\_offset = [8] that corresponding to 64 slots for 120kHz SCS* |

* Proposals
  + Option 1 (Qualcomm): Consider a K\_offset value of 258sec or 2064 slots for GSO scenarios.
  + Option 2: Set K\_offset = 8 that corresponding to 64 slots for 120kHz SCS
* Recommended WF
  + Further discuss is needed.
  + Moderator observation:
    - RAN4 agreed to define one set of performance requirements in last RAN4#110bis meeting, if we set K\_offset = 8 (number of slots in 15kHz SCS) for LEO and K\_offset = 258 for GEO, there will be different test setup for LEO and GEO but with the same performance requirements.

**Table 2.2.2-1 Satellite-UE RTT delay for tilt angle α=30° under different scenario [R4-2405144]**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | | Unit | | |
| ms | K\_offset | slot |
| **Delay/ms** | **LEO-600** | 7.17 | 8 | 64 |
| **LEO-1200** | 13.34 | 14 | 112 |
| **GEO** | 257.58 | 258 | 2064 |

* + - No performance impact with different K\_offset configuration (RTT delay), larger K\_offset will cause longer test time because UE needs to wait for K\_offset ms every 16/32 HARQ processes processing.
  + Suggested WF: To reduce the test time, prefer to use K\_offset = 8

**Issue 1-2-2: PTRS configuration**

* Proposals
  + Option 1 (Qualcomm): Consider PTRS configuration with K=2 and L=1 for simulation assumptions.
  + Option 2 (Huawei): Do not configure PTRS for all PDSCH demodulation requirements for above 10 GHz bands.
* Recommended WF
  + Further discuss is needed.
  + Moderator observation:
    - Refer to the discussion on Issue 1-1-1 under [111][316] Demod\_Maintenance
    - With or without PT-RS configured with 20GHz frequency, performance difference should be minor, no further alignment is needed for different PT-RS configuration in the simulation
  + Suggested WF:
    - No need further ideal simulation results alignment among companies with and without PT-RS configured in the simulation
    - Not configure PT-RS for case with MCS 4, further discuss the case with MCS13?
    1. Sub-topic 1-3: PDCCH requirements for above 10 GHz bands

**Issue 1-3-1: CORESET RB & CORESET duration**

* Agreement in previous meeting (R4-2406024, RAN4#110b)

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ***Case*** | ***Bandwidth (MHz)*** | ***SCS (kHz)*** | ***CORESET RB*** | ***CORESET duration*** | ***Aggregation level*** | ***CCE to REG mapping type*** | ***REG bundle size*** | ***Interleaver size*** | ***Shift index*** | ***DCI format*** | ***Payload (without CRC)*** |
| *1* | *200* | *120* | *60* | *1* | *8* | *Interleaved* | *2* | *3* | *0* | *[1-0]* | *[40]* |
| *2* | *200* | *120* | *60* | *2* | *16* | *Interleaved* | *2* | *3* | *0* | *[1-1]* | *[56]* |

* Proposals
  + Option 1 (Ericsson): 132 for the CORESET RB, 1 for CORESET duration
* Recommended WF
  + This proposal is agreeable as per offline discussion before the meeting.

**Issue 1-3-2: Payload size for DCI format 1\_0 case**

* Agreement in previous meeting (R4-2406024, RAN4#110b)

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ***Case*** | ***Bandwidth (MHz)*** | ***SCS (kHz)*** | ***CORESET RB*** | ***CORESET duration*** | ***Aggregation level*** | ***CCE to REG mapping type*** | ***REG bundle size*** | ***Interleaver size*** | ***Shift index*** | ***DCI format*** | ***Payload (without CRC)*** |
| *1* | *200* | *120* | *60* | *1* | *8* | *Interleaved* | *2* | *3* | *0* | *[1-0]* | *[40]* |
| *2* | *200* | *120* | *60* | *2* | *16* | *Interleaved* | *2* | *3* | *0* | *[1-1]* | *[56]* |

* Proposals
  + Option 1 (Ericsson, Huawei): 42
* Recommended WF
  + This proposal is agreeable as per offline discussion before the meeting.

1. Topic #2: SAN demodulaton requirements

## Companies’ contributions summary

|  |  |  |
| --- | --- | --- |
| **T-doc number** | **Company** | **Proposals / Observations** |
| [**R4-2407142**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_111/Docs/R4-2407142.zip) | Nokia | Observation 1: Our understanding is that current SAN architectures use only 1 Rx demodulation branch.  Observation 2: For TN networks only one requirement for each PUCCH format is defined.  Proposal 1: RAN4 to discuss whether both 1 and 2 Rx requirements are required for PUCCH.  Observation 3: The FRC annex numbering on NTN specifications does not align with those of the TN specifications.  Proposal 2: RAN4 to discuss whether TN and NTN FRCs should aim to be aligned. |
| [**R4-2407476**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_111/Docs/R4-2407476.zip) | CATT | Simulation results for SAN demodulation requirements for above 10 GHz bands |
| [**R4-2408339**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_111/Docs/R4-2408339.zip) | Ericsson | Observation 1 The target SNR of MCS12 could meet the link budget result for scenario of Ka-band VAST with LEO600 at 30o elevation angle.  Proposal 1 Define PUSCH requirements without transform precoding for both MCS 2 and MCS 12.  Proposal 2 Do not consider PT-RS configuration for MCS 12 normal PUSCH requirement. |
| [**R4-2408340**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_111/Docs/R4-2408340.zip) | Ericsson | Simulation results for NR NTN enhancement SAN demodulation requirements |
| [**R4-2408973**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_111/Docs/R4-2408973.zip) | Huawei,HiSilicon | Proposal 1: Confirm to use MCS 2 and MCS 12 for SAN demodulation requirements for normal PUSCH with CP-OFDM for above 10 GHz bands. |
| [**R4-2408974**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_111/Docs/R4-2408974.zip) | Huawei,HiSilicon | Simulation results on SAN demodulation requirements for NR NTN enhancements |
| [**R4-2409482**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_111/Docs/R4-2409482.zip) | Samsung | Simulation results and proposals.  Observation 1: The SNR targeting 70% TP for MCS 12 is around 7dB for 1T1R, with considering the impairment margin, it shall be feasible to define PUSCH requirement with MCS 12  Proposal 1: MCS 12 can be considered to specific the PUSCH requirement for NTN enhancement.  Proposal 2: Update the test metric of PUSCH requirement with repetition mapping type A for above 10GHz as BLER% 1, where BLER is defined as residual BLER; i.e., ratio of incorrectly received transport blocks / sent transport blocks, independently of the number HARQ transmission(s) for each transport block |
| R4-2408978 | Huawei,HiSilicon | Simulation results summary on demodulation requirements for NR NTN enhancements |
| R4-2408977 | Huawei,HiSilicon | Updated Simulation assumption on demodulation requirements for NR NTN enhancements |

## Open issues summary

* + 1. Sub-topic 2-1: General issues for above 10 GHz bands

**Issue 2-1-1: FRC Alignment with TN Specs**

* Proposals
  + Option 1 (Nokia): RAN4 to discuss whether TN and NTN FRCs should aim to be aligned.
* Recommended WF
  + Can refer to discussion on Issue 1-1-3.
    1. Sub-topic 2-2: Test setup for normal PUSCH with CP-OFDM for above 10 GHz bands

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

* Agreement in previous meeting (R4-2406024, RAN4#110b)

|  |
| --- |
| * *MCS 2 and [MCS 12]* |

* Proposals
  + Option 1 (Ericsson, Huawei, Samsung): MCS 12.
* Recommended WF
  + Agree MCS 12.

**Issue 2-2-2: PTRS configuration**

* Agreement in previous meeting (R4-2406024, RAN4#110b)

|  |
| --- |
| * *Not configure PTRS for test with MCS 2 and [MCS12]* |

* Proposals
  + Option 1 (Ericsson, Huawei): Do not consider PT-RS configuration for MCS 12 normal PUSCH requirement.
* Recommended WF
  + Option 1 should be agreeable, because the main concern in last meeting is about the feasibility of MCS 12.

**Issue 2-2-3: Test Metric for PUSCH repetition Type A**

* Agreement in previous meeting (R4-2405146, RAN4#110b)

|  |  |
| --- | --- |
| *Test metric* | *70% of maximum throughput* |

* Proposals
  + Option 1 (Samsung, Huawei): Update the test metric of PUSCH requirement with repetition mapping type A for above 10GHz as BLER% 1, where BLER is defined as residual BLER; i.e., ratio of incorrectly received transport blocks / sent transport blocks, independently of the number HARQ transmission(s) for each transport block.
* Recommended WF
  + Option 1 is agreeable which is same as the test metric for TN PUSCH repetition Type A requirements.
    1. Sub-topic 2-3: Test setup for PUCCH for above 10 GHz bands

**Issue 2-3-1: Defining PUCCH requirements for 1 and 2 sets of demodulation branches**

* Agreement in previous meeting

|  |
| --- |
| * *For the SAN Rx, we need both 1Rx and 2Rx. (R4-2316921, RAN4#108b)* * *Keep the previous agreement to consider both 1Tx1Rx and 1Tx2Rx (R4-2321187, RAN4#109)* |

* Proposals
  + Option 1 (Nokia): RAN4 to discuss whether both 1 and 2 Rx requirements are required for PUCCH.
* Recommended WF
  + Moderator observation:
    - There is same discussion on the antenna configuration for SAN requirements definition in both RAN4#108bis and RAN4#109, finally the agreement is to consider both 1T1R and 1T2R.
    - Moderator prefers to keep the previous agreement in the last meeting of this WI if no technical concern.
  + Suggested WF: Keep the previous agreement to include both 1Rx and 2Rx requirements, the testing is based on the manufacture declaration of the supported number of polarization as defined in 11.1.1.
    1. Sub-topic 2-4: Test metric for PRACH for above 10 GHz bands

**Issue 2-4-1: Test metric for PRACH false alarm requirements**

* Background

Test metric in simulation assumption R4-2405146 is shown below:

|  |  |
| --- | --- |
| Test metric | 1% of DTX to ACK probability  1% of ACK missed detection probability |

But as per the usual PRACH performance testing, test metrics should be:

* The false alarm probability shall be less than or equal to 0.1%.
* The probability of detection shall be equal to or exceed 99%
* Proposals
  + Option 1 (Huawei): Update test metric for PRACH performance testing as following:
    - The false alarm probability shall be less than or equal to 0.1%.
    - The probability of detection shall be equal to or exceed 99%
* Recommended WF
  + Option 1 is agreeable which is same as the test metric for TN and FR1-NTN PRACH performance requirements

1. Topic #3: CR list

## CRs list for UE demodulation requirements

|  |  |  |
| --- | --- | --- |
| **TDoc** | **Title** | **Source** |
| [**R4-2407146**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_111/Docs/R4-2407146.zip) | [NR\_NTN\_enh-Perf] draftCR on PUCCH performance requirements for 38.108 | Nokia |
| [**R4-2407147**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_111/Docs/R4-2407147.zip) | [NR\_NTN\_enh-Perf] draftCR on propagation conditions and channels for 38.108 | Nokia |
| [**R4-2407148**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_111/Docs/R4-2407148.zip) | [NR\_NTN\_enh-Perf] draftCR on PUSCH demodulation requirements for 38.181 | Nokia |
| R4-2407149 | [NR\_NTN\_enh-Perf] bigCR for 38.108, NR\_NTN Demodulation requirements | Nokia |
| [**R4-2407252**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_111/Docs/R4-2407252.zip) | Draft CR to 38.101-5 on eNTN demod requirements for PDCCH | Apple |
| [**R4-2407357**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_111/Docs/R4-2407357.zip) | Draft CR to 38.101-5 for updates to Annex C | Apple |
| [**R4-2408641**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_111/Docs/R4-2408641.zip) | [NR\_NTN\_enh-Perf] Draft CR to 38.101-5 Reference measurement channel for PDCCH requirements and channel model for NR NTN enhancements | Qualcomm India Pvt Ltd |
| [**R4-2408745**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_111/Docs/R4-2408745.zip) | Draft CR to 38.101-5 FRC for PDSCH performance requirement | Ericsson |
| R4-2408979 | Big CR on NTN demodulation requirements (TS38.101-5, Rel-18) | Huawei,HiSilicon |
| [**R4-2408980**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_111/Docs/R4-2408980.zip) | Draft CR on NTN PDSCH demodulation requirements (TS38.101-5, Rel-18) | Huawei,HiSilicon |

## CRs list for SAN demodulation requirements

|  |  |  |
| --- | --- | --- |
| **TDoc** | **Title** | **Source** |
| [**R4-2407145**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_111/Docs/R4-2407145.zip) | [NR\_NTN\_enh-Perf] draftCR on performance requirements for 38.101-5 | Nokia |
| [**R4-2407477**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_111/Docs/R4-2407477.zip) | Draft CR for TS 38.108, On Performance requirements for PRACH in clause 11.4 for Ka-band NTN | CATT |
| [**R4-2407510**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_111/Docs/R4-2407510.zip) | Draft CR for TS 38.181, Introduction on OTA performance requirement for PRACH | CATT |
| [**R4-2408341**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_111/Docs/R4-2408341.zip) | (NR\_NTN\_enh-Perf) Draft CR for 38.181 on SAN demodulation requirements | Ericsson |
| R4-2408342 | (NR\_NTN\_enh-Perf) Draft big CR for 38.181 on SAN demodulation requirements | Ericsson |
| [**R4-2408981**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_111/Docs/R4-2408981.zip) | Draft CR on NTN radiated performance requirements for PUSCH (TS38.108, Rel-18) | Huawei,HiSilicon |
| [**R4-2408982**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_111/Docs/R4-2408982.zip) | Draft CR on MU, manufacturer declarations and applicability rules for NTN (TS38.181, Rel-18) | Huawei,HiSilicon |
| [**R4-2408983**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_111/Docs/R4-2408983.zip) | Draft CR on NTN OTA performance requirements for PUCCH (TS38.181, Rel-18) | Huawei,HiSilicon |
| [**R4-2409483**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_111/Docs/R4-2409483.zip) | Draft CR on performance requirements for PUSCH with DM-RS bundling | Samsung |
| [**R4-2409484**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_111/Docs/R4-2409484.zip) | Draft CR on OTA performance requirements for PUSCH | Samsung |

1. Topic #4: Documents and suggested status

## Documents lists for discussion and simulation results

|  |  |  |
| --- | --- | --- |
| **TDoc** | **Suggest status** | **Comments** |
| [**R4-2407143**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_111/Docs/R4-2407143.zip) | Noted |  |
| [**R4-2407144**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_111/Docs/R4-2407144.zip) | Noted |  |
| [**R4-2407251**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_111/Docs/R4-2407251.zip) | Noted |  |
| [**R4-2408678**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_111/Docs/R4-2408678.zip) | Noted |  |
| [**R4-2408679**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_111/Docs/R4-2408679.zip) | Noted |  |
| [**R4-2408746**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_111/Docs/R4-2408746.zip) | Noted |  |
| [**R4-2408747**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_111/Docs/R4-2408747.zip) | Noted |  |
| [**R4-2408975**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_111/Docs/R4-2408975.zip) | Noted |  |
| [**R4-2408976**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_111/Docs/R4-2408976.zip) | Noted |  |
| [**R4-2407142**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_111/Docs/R4-2407142.zip) | Noted |  |
| [**R4-2407476**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_111/Docs/R4-2407476.zip) | Noted |  |
| [**R4-2408339**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_111/Docs/R4-2408339.zip) | Noted |  |
| [**R4-2408340**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_111/Docs/R4-2408340.zip) | Noted |  |
| [**R4-2408973**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_111/Docs/R4-2408973.zip) | Noted |  |
| [**R4-2408974**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_111/Docs/R4-2408974.zip) | Noted |  |
| [**R4-2409482**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_111/Docs/R4-2409482.zip) | Noted |  |
| R4-2408978 | Noted |  |

## Documents lists for CRs

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| **TDoc** | **Suggest status** | **Comments** |
| [**R4-2407145**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_111/Docs/R4-2407145.zip)  (Nokia, TS 38.101-5 for general) | Revised | Moderator:  1: Considering the existing 4.1 section clarification, maybe section 8.1.1 is not necessary, so no corresponding 11.1.1 is needed?  2: Table 11.2.1.1.2-1 needs to be update to include the correct clause and Test number as per R4- |
| [**R4-2407146**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_111/Docs/R4-2407146.zip)  (Nokia, TS 38.108 for PUCCH) | Revised | Moderator:  Update the SNR value as per the submitted simulation results |
| [**R4-2407147**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_111/Docs/R4-2407147.zip)  (Nokia, TS 38.108 for FRC) | Revised | Moderator:  1: RAN4 agrees MCS2 (193/1024) and MCS12 (434/1024) in Table 1 for PUSCH requirements for above 10GHz; MCS5 (99/1024) in table 3 for PUSCH repetition for FR2-NTN; MCS4 (308/1024) in Table 1 for PUSCH with DMRS bundling for FR1-NTN  2: A.4 is used for PRACH test preambles, can start from A.5  3: D.2.1.2-2 ~ D.2.1.2-4. Should be D.2.1.2-2 ~ D.2.1.2-3. |
| [**R4-2407148**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_111/Docs/R4-2407148.zip)  (Nokia, TS 38.181 for PUSCH DMRS bundling) | Revised | Moderator:  1: Revision mark in the coversheet is not allowed as per 3GPP principle.  2: Other specs affected: usually core spec updates will affect the test spec, no reverse.  3: Updates to section 8.2.4.5should be 8.2.4.4.2, but this update can be done by TEI, because it does not belong to this WI.  4: section 8.2.5.5, throughput measurements should as per clause 8.2.5.4.4  5: SNR updates as per the submitted simulation results |
| [**R4-2407252**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_111/Docs/R4-2407252.zip)  (Apple, TS 38.101-5 for PDCCH) | Revised | Moderator:  1: Table 11.2.3-1: “Symbols for all unused REs”: only FDD is needed.  2: SNR needs to be updated as per the submitted results. |
| [**R4-2407357**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_111/Docs/R4-2407357.zip)  (Apple, TS 38.101-5 Annex C) | Agreeable | Moderator: No comments |
| [**R4-2407477**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_111/Docs/R4-2407477.zip)  (CATT, TS 38.108 for PRACH) | Revised | Moderator: SNR needs to be updated as per the submitted results |
| [**R4-2407510**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_111/Docs/R4-2407510.zip)  (CATT, TS 38.181 for PRACH) | Revised | Moderator: SNR needs to be updated as per the submitted results |
| [**R4-2408341**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_111/Docs/R4-2408341.zip)  (Ericsson, TS 38.181 for Annex) | Revised | Moderator: FRC for MCS12 (434/1024) is missing; FRC for MCS4 (308/1024) is not needed. |
| [**R4-2408641**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_111/Docs/R4-2408641.zip)  (Qualcomm, TS 38.101-5 for PDCCH FRC and channel model) | Revised | Moderator:  1: For ongoing WI, no WI code is need in the front of the CR title  2: need to update the “CORESET frequency domain allocation” and “Payload (without CRC)” as per the latest agreements to be reached during this meeting. |
| [**R4-2408745**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_111/Docs/R4-2408745.zip)  (Ericsson, TS 38.101-5 FRC for PDSCH) | Agreeable |  |
| [**R4-2408980**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_111/Docs/R4-2408980.zip)  (Huawei, TS 38.101-5 PDSCH requirements) | Revised | Moderator: SNR needs to be updated as per the submitted results |
| [**R4-2408981**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_111/Docs/R4-2408981.zip)  (Huawei, TS 38.108 PUSCH requirements) | Revised | Moderator: SNR needs to be updated as per the submitted results |
| [**R4-2408982**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_111/Docs/R4-2408982.zip)  (Huawei, TS 38.181 MU, applicability) | Agreeable |  |
| [**R4-2408983**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_111/Docs/R4-2408983.zip)  (Huawei, TS 38.181 PUCCH requirements) | Revised | Moderator: SNR needs to be updated as per the submitted results |
| [**R4-2409483**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_111/Docs/R4-2409483.zip)  (Samsung, TS 38.108 PUSCH DMRS bundling) | Revised | Moderator: SNR needs to be updated as per the submitted results |
| [**R4-2409484**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_111/Docs/R4-2409484.zip)  (Samsung, TS 38.181 PUSCH requirements) | Revised | Moderator:  1: As per TS 38.101-5 Table 5.1-1, the frequency range should be named FR1-NTN and FR2-NTN.  2: Test parameters configuration and AWGN power level should be updated based on the existing spec with revision mark.  3: SNR needs to be updated as per the submitted results for this meeting  4: Clause number of the requirements defined in TS 38.108 |
| [**R4-2408977**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_111/Docs/R4-2408977.zip) | Approvable |  |
| R4-2407149 | Post email approval | Big CR for TS 38.108 on SAN demodulation requirements |
| R4-2408342 | Post email approval | big CR for 38.181 on SAN conformance requirements |
| R4-2408979 | Post email approval | Big CR for TS 38.101-5 on NTN UE demodulation requirements |