**3GPP TSG-WG4 Meeting #111  *R4-2409858***

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

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| *CR-Form-v12.3* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **38.101-5** | **CR** | **draftCR** | **rev** | **-** | **Current version:** | **18.5.0** |  |
|  | | | | | | | | |
| *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 |  | Radio Access Network | **X** | Core Network |  |

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| ***Title:*** | [NR\_NTN\_enh-Perf] draftCR on performance requirements for 38.101-5 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | Nokia | | | | | | | | | |
| ***Source to TSG:*** | RAN4 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | NR\_NTN\_enh-Perf | | | | |  | ***Date:*** | | | 2024-05-08 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | **B** |  | | | | | ***Release:*** | | | Rel-18 |
|  | *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-8 (Release 8) Rel-9 (Release 9) Rel-10 (Release 10) Rel-11 (Release 11) … Rel-17 (Release 17) Rel-18 (Release 18) Rel-19 (Release 19)  Rel-20 (Release 20)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | Introduction of new Radiated performance requirements. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | Introduction of new general sections for clause 11 on radiated requirements. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | Radiated requirements will not be introduced. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 11 , 11.1, 11.2 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **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 CR's revision history:*** | | Revision of R4-2407145 | | | | | | | | |

***<Start of Change 1>***

# 11 Demodulation performance requirements (Radiated requirements)

## 11.1 General

### 11.1.2 Applicability of minimum requirements

The conducted minimum requirements specified in this specification shall be met in all applicable scenarios for FR2-NTN.

### 11.1.3 Conducted requirements

#### 11.1.3.1 Introduction

The requirements are defined for the following modes:

- Mode 1: Conditions with external noise source

- Wanted signal with power level Es is transmitted.

- External white noise source with power spectral density Noc is used.

- *Es* and *Noc* levels are selected to achieve target SNR as described in Clause 11.1.3.3.

#### 11.1.3.2 Reference point

The reference point for SNR, Es and Noc of DL signal is the UE antenna connector or connectors.

#### 11.1.3.3 SNR definition

For Mode 1 conditions UE demodulation and CSI requirements, the Minimum performance requirement in clause 7, 8, 9 and 10 are defined relative to the baseband SNR level SNRBB*.* The SNR at the reference point is defined as

*SNR = SNRBB +* ***∆BB***

where **∆BB**is specified in clause 4.5.3.

The reference point SNR is defined as:

- NRX denotes the number of receiver reference points, and the super script receiver reference point *j*.

- The above SNR definition assumes that the REs are not precoded, and does not account for any gain which can be associated to the precoding operation.

- Unless otherwise stated, the SNR refers to the SSS wanted signal.

- The downlink SSS transmit power is defined as the linear average over the power contributions in [W] of all resource elements that carry the SSS within the operating system bandwidth.

- The power ratio of other wanted signals to the SSS is defined in Clause C.3.1.

#### 11.1.3.4 Noc

##### 11.1.3.4.1 Introduction

This clause describes the Noc power level for Mode 1 conditions conducted testing of demodulation and CSI requirements.

##### 11.1.3.4.2 Noc for operating bands in FR2-NTN

Unless otherwise stated, a fixed Noc power level of -145 dBm/Hz shall be used for all operating bands.

## 11.2 Demodulation performance requirements

### 11.2.1 General

#### 11.2.1.1 Applicability of requirements

##### 11.2.1.1.1 General

The minimum performance requirements are applicable to all FR2-NTN operating bands defined in clause [5.3].

If same test is listed for different UE features/capabilities in Clauses 11.2.1.1.2, then this test shall apply for UEs which support all corresponding UE features/capabilities.

##### 11.2.1.1.2 Applicability of requirements for optional UE features

The performance requirements in Table 11.2.1.1.2-1 shall apply for UEs which support optional UE features only.

Table 11.2.1.1.2-1: Requirements applicability for optional UE features

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **UE feature/capability [TBD]** | **Test type** | | **Test list** | **Applicability notes** |
| NR NTN access (nonTerrestrialNetwork-r17) | FR2-NTN | PDSCH | Clause 11.2.2.1.1.1 (Test 1-1, Test 1-2, Test 1-3, Test 1-4) |  |
| FR2-NTN | PDCCH | Clause 11.2.3.1.1.1 (Test 1-1, Test 1-2) |  |
| NR NTN scenario support (ntn-ScenarioSupport-r17) | FR2-NTN | PDSCH | Clause 11.2.2.1.1.1 (Test 2-1, Test 2-2, Test 2-3, Test 2-4) | The requirements apply only when *ntn-ScenarioSupport-r17* is “gso” |
| FR2-NTN | PDSCH | Clause 11.2.2.1.1.1 (Test 1-1, Test 1-2, Test 1-3, Test 1-4) | The requirements apply only when *ntn-ScenarioSupport-r17* is “ngso” or is not configured. |
| FR2-NTN | PDCCH | Clause 11.2.3.1.1.1 (Test 1-1, Test 1-2) |
| Increasing the number of HARQ processes (max-HARQ-ProcessNumber-r17) | FR2-NTN | PDSCH | Clause 11.2.1.2.2.1 (Test 1-3) |  |
| Disabled HARQ feedback for downlink transmission (harq-FeedbackDisabled-r17) | FR2-NTN | PDSCH | Clause 11.2.1.2.2.1 (Test 1-4) |  |
| Note: For UE supporting NR NTN access (nonTerrestrialNetwork-r17), the requirements in TS38.101-4 also applies to UE according to applicability rules in TS38.101-4 Clause 5.1, 6.1, 7.1 and 8.1 | | | | |

***<End of Change 1>***