**3GPP TSG-RAN4 Meeting #111 *R4-2410189***

**Fukuoka, Japan, 20 – 24 May, 2024**

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| *CR-Form-v12.3* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  |  | **CR** |  | **rev** | 1 | **Current version:** |  |  |
|  | | | | | | | | |
| *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 | **x** | Radio Access Network |  | Core Network |  |

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|  | | | | | | | | | | |
| ***Title:*** | draftCR on performance requirements for SL positioning | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | Huawei, HiSilicon | | | | | | | | | |
| ***Source to TSG:*** | R4 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | NR\_pos\_enh2-Perf | | | | |  | ***Date:*** | | | 2024-04-23 |
|  |  | | | |  | |  | | |  |
| ***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:*** | | Based on work split R4-2406382, this draftCR includes following accuracy requirements for SL positioning.   * 2-13 Measurement Accuracy (for SL Rx-Tx) | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | Introduce accuracy requirements for SL positioning based on work split. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | Performance requirements for SL positioning are incomplete. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 10.4A.4.2 (new) | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **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:*** | |  | | | | | | | | |

<Start of Change 1: 2-13>

#### 10.4A.4.2 Measurement Accuracy

The SL Rx-Tx time difference measurement accuracy requirements in this clause shall not apply, if:

- NTA\_offset defined in Table 7.1.2-2 changes during the UE Rx-Tx measurement period and

- the reference timing used for SL PRS transmissions is a NR serving cell.

The SL Rx-Tx time difference measurement accuracy requirements in this clause shall apply provided that:

- The UE transmits SL PRS within [-160, 160] msec of at least one SL PRS resource of each of the anchor UEs in the assistance data.

The accuracy requirements in Table 10.4A.4.2-1 for FR1 are valid under the following conditions:

- Conditions defined in clause 7.3E of TS 38.101-1 [18] for reference sensitivity are fulfilled.

- SL PRP|dBm according to Annex B.4A.1 for a corresponding Band.

- AWGN propagation condition.

Table 10.4A.4.2-1: SL Rx-Tx time difference measurement accuracy in FR1 in AWGN

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Accuracy | Conditions | | | | | | |
| PRS Ês/Iot | Minimum PRS bandwidth | Number of samples, S | PRS SCS | NR operating band groupsNote 2 | IoNote 3 range | |
| Minimum IoNote 1 | Maximum Io |
| TcNote 4 | dB | RB |  | kHz |  | dBm / SCSPRS | dBm/BW |
| ± TBD+δ | [-3] | 48 | ≥ 4 | 15 | NR\_TDD\_FR1\_B | -120.5 | -50 |
| NR\_TDD\_FR1\_J | -116.5 |
| >48 | ≥ 1 | NOTE 5 | NOTE 5 | NOTE 5 |
| ± TBD+δ | ≥ 96 | ≥ 1 | NOTE 5 | NOTE 5 | NOTE 5 |
| ± TBD+δ | ≥ 24 | ≥ 4 | 30 | NR\_TDD\_FR1\_B | -117.5 | -50 |
| NR\_TDD\_FR1\_J | -113.5 |
| ± TBD+δ | >48 | ≥ 1 | NOTE 5 | NOTE 5 | NOTE 5 |
| ± TBD+δ | ≥ 24 | ≥ 4 | 60 | NR\_TDD\_FR1\_B | -114.5 | -50 |
| NR\_TDD\_FR1\_J | -110.5 |
| NOTE 1: This minimum Io condition is expressed as the average Io per RE over all REs in an OFDM symbol.  NOTE 2: NR operating band groups are as defined in Section 3.5.  NOTE 3: The Io is defined in PRS slots. The same Io range applies to PRS and non-PRS symbols. Io levels are different in PRS and non-PRS symbols within the same slot.  NOTE 4: Tc is the basic timing unit defined in TS 38.211 [6].  NOTE 5: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding requirement with the PRS bandwidth of the smallest RB number for the corresponding SCS.  NOTE 6: δ is the margin determined from Table 10.4A.4.2-3. | | | | | | | |

The accuracy requirements in Table 10.4A.4.2-2 for FR1 are valid under the following conditions:

- Conditions defined in clause 7.3E of TS 38.101-1 [18] for reference sensitivity are fulfilled.

- SL PRP|dBm according to Annex B.4A.1 for a corresponding Band.

- Fading propagation condition.

Table 10.4A.4.2-2: SL Rx-Tx time difference measurement accuracy in FR1 in fading

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Accuracy | Conditions | | | | | | |
| PRS Ês/Iot | Minimum PRS bandwidth | Number of samples, S | PRS SCS | NR operating band groupsNote 2 | IoNote 3 range | |
| Minimum IoNote 1 | Maximum Io |
| TcNote 4 | dB | RB |  | kHz |  | dBm / SCSPRS | dBm/BW |
| ± TBD+δ | [-3] | 48 | ≥ 4 | 15 | NR\_TDD\_FR1\_B | -120.5 | -50 |
| NR\_TDD\_FR1\_J | -116.5 |
| >48 | ≥ 1 | NOTE 5 | NOTE 5 | NOTE 5 |
| ± TBD+δ | ≥ 96 | ≥ 1 | NOTE 5 | NOTE 5 | NOTE 5 |
| ± TBD+δ | ≥ 24 | ≥ 4 | 30 | NR\_TDD\_FR1\_B | -117.5 | -50 |
| NR\_TDD\_FR1\_J | -113.5 |
| ± TBD+δ | >48 | ≥ 1 | NOTE 5 | NOTE 5 | NOTE 5 |
| ± TBD+δ | ≥ 24 | ≥ 4 | 60 | NR\_TDD\_FR1\_B | -114.5 | -50 |
| NR\_TDD\_FR1\_J | -110.5 |
| NOTE 1: This minimum Io condition is expressed as the average Io per RE over all REs in an OFDM symbol.  NOTE 2: NR operating band groups are as defined in Section 3.5.  NOTE 3: The Io is defined in PRS slots. The same Io range applies to PRS and non-PRS symbols. Io levels are different in PRS and non-PRS symbols within the same slot.  NOTE 4: Tc is the basic timing unit defined in TS 38.211 [6].  NOTE 5: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding requirement with the PRS bandwidth of the smallest RB number for the corresponding SCS.  NOTE 6: δ is the margin determined from Table 10.4A.4.2-3. | | | | | | | |

Table 10.4A.4.2-3: Margin for UE Rx-Tx time difference measurement accuracy in FR1

|  |  |  |  |
| --- | --- | --- | --- |
| Min(PRS BW, SRS BW) (RB) | | | Margin (Tc) |
| SCS = 15 kHz | SCS = 30 kHz | SCS = 60 kHz |
| ≥ [48] | ≥ [24] | N/A | TBD |
| ≥ [96] | ≥ [48] | ≥ [24] | TBD |

<End of Change 1: 2-13>