**3GPP TSG- Meeting # *draft* R1-22NNNN**

**-Meeting, - , 2022**

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| *CR-Form-v12.2* | | | | | | | | |
| **Draft CHANGE REQUEST** | | | | | | | | |
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|  |  | **CR** |  | **rev** |  | **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 | **X** | Core Network |  |

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| ***Title:*** |  | | | | | | | | | |
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| ***Source to WG:*** | Moderator(Ericsson), , Huawei, HiSilicon | | | | | | | | | |
| ***Source to TSG:*** | RAN1 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | NR\_pos\_enh-Core | | | | |  | ***Date:*** | | | 14 |
|  |  | | | |  | |  | | |  |
| ***Category:*** |  |  | | | | | ***Release:*** | | |  |
|  | *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-16 (Release 16) Rel-17 (Release 17) Rel-18 (Release 18) Rel-19 (Release 19)* | |
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| ***Reason for change:*** | | DL PRS RSRPP was agreed as a measurement for DL-TDOA, DL-AoD and multi-RTT, but its description is missing for tor the following physical layer procedures:  - Assistance data reference info  - Time stamp reporting  - LoS/NLoS indicator reporting  - Multiple measurement instances in a single report | | | | | | | | |
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| ***Summary of change:*** | | Add description related to DL PRS-RSRPP into TS38.214 for applicable measurements. | | | | | | | | |
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| ***Consequences if not approved:*** | | The specification description is incomplete regarding DL PRS-RSRPP. | | | | | | | | |
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| ***Clauses affected:*** | | 5.1.6.5 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **Y** | **N** |  | | | |  | | |
| ***Other specs*** | |  |  | Other core specifications | | | | TS/TR ... CR ... | | |
| ***affected:*** | |  |  | Test specifications | | | | TS/TR ... CR ... | | |
| ***(show related CRs)*** | |  |  | O&M Specifications | | | | TS/TR ... CR ... | | |
|  | |  | | | | | | | | |
| ***Other comments:*** | |  | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | |  | | | | | | | | |

#### 5.1.6.5 PRS reception procedure

**<Unchanged parts omitted>**

The UE assumes constant EPRE is used for all REs of a given DL PRS resource.

The UE may be indicated by the network that DL PRS resource(s) can be used as the reference for the DL RSTD, DL PRS-RSRP, DL PRS-RSRPP, and UE Rx-Tx time difference measurements in a higher layer parameter *nr-DL-PRS-ReferenceInfo*. The reference indicated by the network to the UE can also be used by the UE to determine how to apply higher layer parameters *nr-DL-PRS-ExpectedRSTD* and *nr-DL-PRS-ExpectedRSTD-Uncertainty*. The UE expects the reference to be indicated whenever it is expected to receive the DL PRS. This reference provided by *nr-DL-PRS-ReferenceInfo* may include a *dl-PRS-ID*, a DL PRS resource set ID, and optionally a single DL PRS resource ID or a list of DL PRS resource IDs [17, TS 37.355]. The UE may use different DL PRS resources or a different DL PRS resource set to determine the reference for the RSTD measurement as long as the condition that the DL PRS resources used belong to a single DL PRS resource set is met. If the UE chooses to use a different reference than indicated by the network, then it is expected to report the *dl-PRS-ID*, the DL PRS resource ID(s) or the DL PRS resource set ID used to determine the reference.

The UE may be configured to report quality metrics *NR-TimingQuality* corresponding to the DL RSTD and UE Rx-Tx time difference measurements which include the following fields:

*- timingQualityValue* which provides the best estimate of the uncertainty of the measurement

*- timingQualityResolution* which specifies the resolution levels used in the *timingQualityValue* field.

The UE expects to be configured with higher layer parameter *nr-DL-PRS-ExpectedRSTD*, which defines the time difference with respect to the received DL subframe timing the UE is expected to receive DL PRS, and *nr-DL-PRS-ExpectedRSTD-Uncertainty*, which defines a search window around the *nr-DL-PRS-ExpectedRSTD*.

For DL UE positioning measurement reporting in higher layer parameters *NR-DL-TDOA-SignalMeasurementInformation* or *NR-Multi-RTT-SignalMeasurementInformation* the UE can be configured to report the DL PRS resource ID(s) or the DL PRS resource set ID(s) associated with the DL PRS resource(s) or the DL PRS resource set(s) which are used in determining the UE measurements DL RSTD, or UE Rx-Tx time difference, respectively.

**<Unchanged parts omitted>**

For the DL RSTD, DL PRS-RSRP, DL PRS-RSRPP and UE Rx-Tx time difference measurements the UE reports an associated higher layer parameter *nr-TimeStamp*. The *nr-TimeStamp* can include the *dl-PRS-ID*, the SFN and the slot number for a subcarrier spacing. These values correspond to the reference which is provided by *nr-DL-PRS-ReferenceInfo*.

**<Unchanged parts omitted>**

The UE may be configured to measure and report, subject to UE capability, up to 24 DL PRS-RSRP measurements on DL PRS resources associated with the same *dl-PRS-ID*. When the UE reports DL PRS-RSRP measurements from one DL PRS resource set, the UE may indicate which DL PRS-RSRP measurements associated with the same higher layer parameter *nr-DL-PRS-RxBeamIndex* [17, TS 37.355] have been performed using the same spatial domain filter for reception if for each *nr-DL-PRS-RxBeamIndex* reported there are at least 2 DL PRS-RSRP measurements associated with it within the DL PRS resource set. When the UE reports DL PRS-RSRP measurements for a DL PRS resource, the reported multiple DL PRS-RSRP measurements associated with the same or different higher layer parameter *nr-DL-PRS-RxBeamIndex* may have the same or different timestamps~~.~~ The UE may be configured to measure and optionally report, subject to UE capability, up to 24 DL PRS RSRPP for the first detected path on DL PRS resources associated with the same *dl-PRS-ID*. When the UE reports DL PRS-RSRPP measurements for a DL PRS resource, the reported multiple DL PRS-RSRPP measurements associated with the same or different higher layer parameter *nr-DL-PRS-RxBeamIndex* may have the same or different timestamps.

**<Unchanged parts omitted>**

The UE may be requested, subject to UE capability, to report LoS/NLoS indicator(s) via higher layer parameter *nr-los-nlos-IndicatorRequest*. The UE can report LoS/NLoS indicator(s) via higher layer parameter *nr-los-nlos-Indicator* associated with each DL RSTD, DL PRS-RSRP, DL PRS-RSRPP, and UE Rx-Tx time difference measurements. The UE can report LoS/NLoS indicator(s) via higher layer parameter *nr-los-nlos-Indicator* associated with each *dl-PRS-ID* in a measurement report. For the LoS/NLoS indicator(s) associated with DL RSTD, the UE may report one indicator associated with the *dl-PRS-ID* indicated by higher layer parameter *dl-PRS-ReferenceInfo* and one indicator associated with the *dl-PRS-ID* of the DL RSTD measurement. A UE may be provided with LoS/NLoS indicator(s) via higher layer parameter *nr-los-nlos-Indicator*, and it may be associated with each DL PRS resource of each configured *dl-PRS-ID* or may be associated with each configured *dl-PRS-ID*. The values of the higher layer parameter *LOS-NLOS-Indicator* may be soft values (0, 0.1, …, 0.9, 1) or hard values (0, 1) with the values corresponding to the likelihood of LoS, with a value of 1 corresponding to LoS and a value of 0 corresponding to NLoS.

**<Unchanged parts omitted>**

The UE may be configured to report one or more measurement instances, each with its own timestamp, on DL RSTD, DL PRS-RSRP, DL PRS-RSRPP, and/or UE Rx-Tx time difference measurements, in a single measurement report.

**<Unchanged parts omitted>**