**3GPP TSG RAN WG1 #110bis-e R1-221xxxx**

**e-Meeting, October 10th – 19th, 2022**

**Agenda item:** 9.1.2

**Source:** Moderator (Samsung)

**Title:** Summary of TDCP Alternatives for Comparison

**Document for:** Discussion and Decision

[110bis-e] **Agreement**

For the Rel-18 TRS-based TDCP reporting, down select one of the following alternatives by RAN1#110bis-e:

* AltA. Based on Doppler profile
	+ E.g., Doppler spread derived from the 2nd moment of Doppler power spectrum, average Doppler shifts, Doppler shift per resource, maximum Doppler shift, relative Doppler shift, etc
* AltB. Based on *quantized amplitude of* time-domain correlation profile
	+ E.g. Correlation within one TRS resource, correlation across multiple TRS resources
	+ Note: The correlation over one or more lags of TRS resource may be considered.  The lags may be within one TRS burst or different TRS bursts

Note: Different alternatives may or may not apply to different use cases

FFS: The need for a measure of confidence level in the TDCP report, and/or UE behaviour when the quality of TDCP measurement is not sufficiently high

FFS: TDCP parameter(s) signalled with respect to each alternative

For the purpose of performance comparison and down-selection in RAN1#111, the alternatives for TDCP are summarized below:

**Table 1**

|  |  |  |  |
| --- | --- | --- | --- |
| **TDCP report** | **What to report (spec impact)** | **How to calculate: examples, possible implementation (companies are to state their calculation method)** | **Support (per RAN1#110bis-e)** |
| A1. Doppler spread | One Doppler spread value | * Difference between lowest- and highest-value Doppler shifts in Doppler power spectrum (\*).
* Curve fitting between a known correlation profile as a function of Doppler spread (e.g. $X\left(δ\right)=J\_{0}\left(2πDδ\right)$) with calculated time-domain correlation profile (\*\*)
 | vivo, Google, LG, OPPO, Huawei/HiSi, Xiaomi, Mavenir, Apple (1st pref), CATT, IDC, Spreadtrum, NEC (2nd pref), Nokia/NSB  |
| A2. Relative Doppler shift per resource | With N TRS resources: (1) Doppler shift for a reference TRS resource + (N-1) differential Doppler shifts; (2) CRI of the reference TRS resource | * [A2 proponents]
 | ZTE, .. |
| A3. Relative Doppler shift per CIR peak | With M identified peaks in measured CIR: (1) Doppler shift for a reference CIR peak + (M-1) differential Doppler shifts;(2) M values of delay shift in CIR | * [A3 proponents]
 | ?? |
| B. Time-domain correlation profile  | Non-zero quantized amplitude for each delay value (quantized amplitude vs delay) | * Auto-correlation of a time series measured from a TRS resource.
* Multiple profiles can be calculated from different lags of the same resource or different resources
* [Normalized vs un-normalized] [equation]

[B proponents] | Samsung, Ericsson, MediaTek, vivo, Qualcomm, DOCOMO, OPPO, Sharp, Lenovo, Apple (2nd pref), IDC, NEC (1st pref), CEWiT, Fraunhofer IIS/HHI, |

(\*) Doppler power spectrum is derived from time-domain correlation profile (see B)

(\*\*) Time-domain correlation profile is defined in B.

**Table 2 Additional inputs**

|  |  |
| --- | --- |
| **Company** | **Input** |
| Mod V0 | **Share your inputs, if any, on each cell of Table 1** |
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