3GPP TSG-RAN WG1 Meeting #113 R1-23xxxxx

Incheon, Korea, May 22 – 26, 2023

Agenda Item: 9.17

Source: Ericsson

Title: Editor’s summary on draft CR 38.211 for NR\_pos\_enh2-Core

Document for: Discussion, Decision

# 1 Introduction

This document is intended to facilitate the review process of the draft CR 38.211 for NR\_pos\_enh2-Core.

# 2 Discussion – first round

Please provide your comments on **the latest version of the draft CR on 38.211** available in this folder.

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| **Company** | **Comment** |
| **vivo** | **Comment 1: remove 8.4.5.1.1 general part** Considering SL PRS resource refers to a time-frequency resource within a slot and will be common for different UEs and different sequences, the relation between SL PRS resource and sequence is unclear. So we prefer to remove the content at least.**Comment 2**: mod 12 should be added based on following WAWorking assumption* For SL PRS sequence generation, the parameter  is defined as below:
	+ is provided by higher layers to a Tx UE
		- Details on higher layers, including consideration of Tx UE’s own higher layer, are up to RAN2
		- The higher layer parameter is provided to an Rx UE via LPP/SLPP.
		- FFS: If (pre-)configured for a resource pool and use of SL PRS for sensing is supported,  is based on 12 LSB bits CRC of PSCCH associated with the SL PRS
	+ Otherwise (i.e., if not provided by higher layers),  is based on 12 LSB bits CRC of PSCCH associated with the SL PRS

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| - is the sidelink PRS sequence ID, given by the higher-layer parameter XXX if configured, otherwise where the quantity equals the decimal representation of the CRC for the sidelink control information mapped to the PSCCH associated with the SL-PRS according to ) with and given by clause 7.3.2 in [4, TS 38.212]. |

**Comment 3:** Adding following part in 8.4.5.1.3

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| where- the comb size - the resource-element offset - the starting symbol and number of symbols The reference point for is subcarrier 0 in common resource block 0. |

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| Huawei, HiSilicon | #1. Clause 8.4.1.5/8.4.1.5.x currently in 17.4.0 is for CSI-RS, so SL-PRS should start from 8.4.1.6/8.4.1.6.x. #2. Clause affected on the cover sheet should be filled. #3. No hyphen for ‘SL-PRS’ so better to have ‘SL PRS’ to align with other specs but ok to have SL-PRS in the formulas.#4. ‘given by the higher-layer parameter XXX if configured’ should be FFS because the agreement states ‘is provided by higher layers to a Tx UE’ which also includes Tx UE’s own higher layer without high layer parameter. #5. ‘Mapping to physical resources’ seems better to be changed to ‘Mapping to physical resources in a sidelink PRS resource’ because SL-PRS resources can be multiplexed within a slot. #6: in clause 8.4.1.5.1, ‘used for SL-PRS transmission’ under 8.4.1.5.1 should be deleted because Rx UE or UEs performing sensing in sheme2 will also take the SL PRS mapped in the slot. Moreover, there is no need to have the following characteristics in TS 38.211, which is anyway defined in TS 38.214. The symbols are explained in the clause 8.4.1.5.3.

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| A SL-PRS resource refers to a time-frequency resource within a slot |

#7: in clause 8.4.1.5.3, the description of parameters can be updated below.

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| The sequence shall be multiplied with the amplitude scaling factor and mapped to resources elements according to where- the antenna port - is the comb size provided by the higher layer parameter XXX- is the starting symbol, provided by the higher layer parameter XXX- is the number of symbols provided by the higher layer parameter- the resource-element offset is obtained from the higher-layer parameter XXX- the quantity is given by 8.4.1.5.3-1.The reference point for is subcarrier 0 in common resource block 0.**Table 8.4.1.5.3-1: The frequency offset as a function of .**

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|  | **Symbol number within the sidelink PRS resource**  |
| **0** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** | **11** |
| 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 |
| 4 | 0 | 2 | 1 | 3 | 0 | 2 | 1 | 3 | 0 | 2 | 1 | 3 |
| 6 | 0 | 3 | 1 | 4 | 2 | 5 | 0 | 3 | 1 | 4 | 2 | 5 |

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#8: in clause 8.2.4, antenna ports starting from 6000 for SL-PRS should be added |
| **Intel** | **Comment 1**Section number should be 8.4.1.6.**Comment 2**On SL PRS sequence ID, “given by the higher-layer parameter XXX if configured” does not seem fully aligned with the RAN1 agreement since the details of how the sequence ID is obtained via higher layers is left up to RAN2. Further, we agree with vivo’s suggestion on capturing that the 12 LSB bits are used from the decimal representation of the PSCCH CRC. Thus, we suggest the following modification to address both issues: is the sidelink PRS sequence ID that can be provided by higher layers, otherwise, if not provided by higher layers, where the quantity equals the decimal representation of the CRC for the sidelink control information mapped to the PSCCH associated with the SL-PRS according to with and given by clause 7.3.2 in [4, TS 38.212].**Comment 3**On mapping to physical resources, we think the subclause title is accurate as is. Also, for this subclause, we prefer the modifications suggested by vivo over those from Huawei. While addition of the antenna port number may be fine, the other details may be too premature. For example, the details like comb offset sequence depend on lengths of SL PRS that are supported which is still an open issue in RAN1. For instance, for a dedicated resource pool, the maximum number of SL PRS transmission can be equal to 9, rather than 12, if we assume 1 symbol for PSCCH AGC, 2 symbols for PSCCH, 1 symbol for SL PRS AGC and 1 symbol for guard. Then, for some of the parameters it is still unclear if separate higher layer parameters are to be used for both Tx and Rx UEs – this may depend on how the SL PRS resource ID is determined. Based on RAN1 agreements so far, at least some of these parameters (e.g., starting symbol, RE-offset) associated with a SL PRS resource may be determined by a Tx/Rx UE based on one or more of: higher layers, information in PSCCH/SCI, or selection by Tx UE, etc. Thus, we are not sure it would be appropriate to list all these parameters as being obtained via individual higher layer parameters. **Comment 4**We also suggest replacing “SL-PRS” with “SL PRS” to align terminology across specifications and other RS, like “DL PRS”. **Comment 5**On SL PRS resource definition, we think it is okay to say “used for SL PRS transmission” since that is the fundamental purpose of the resource and even for a receiving UE, the resource is of relevance only in the context of potential SL PRS transmission in there. We are fine with removing the characteristics from 38.211 and let these be captured in 38.214. |
| **Qualcomm** | **Comment 1**We agree with Intel’s wording for , it avoids issues about Rx/Tx UE and the details of how the value is provided by higher layers, which will be decided by RAN2.**Comment 2**Some of the mapping details are being proposed instead as restrictions in 214, for example the mapping on contiguous symbols and not mapping to symbols with PSSCH DMRS. We propose to capture those instead in 211 as part of the mapping procedure to make it clear that these are not error cases, but that PSSCH DMRS and PSCCH are boundaries for SL PRS. Otherwise, the currently proposed text in 214 could be interpreted as PSSCH DMRS or SL PRS puncturing the other, which is not the case. |
| **OPPO** | 1. I would be better to use to align the naming rule as other parameters.

2. How to determine have not been completely decided in RAN1 and RAN2 yet, the working assumption may be changed up to how to address the FFS and RAN2’s decision on the details of higher layers, e.g., whether to introduce a RRC parameter or not. Given that we propose to remove the following for the time being:- is the sidelink PRS sequence ID.Working assumption* For SL PRS sequence generation, the parameter  is defined as below:
	+ is provided by higher layers to a Tx UE
		- Details on higher layers, including consideration of Tx UE’s own higher layer, are up to RAN2
		- The higher layer parameter is provided to an Rx UE via LPP/SLPP.
		- FFS: If (pre-)configured for a resource pool and use of SL PRS for sensing is supported,  is based on 12 LSB bits CRC of PSCCH associated with the SL PRS
	+ Otherwise (i.e., if not provided by higher layers),  is based on 12 LSB bits CRC of PSCCH associated with the SL PRS

3. SL PRS is mapped to a SL-PRS resource, this can also address QC’s comments 2, as according to 214 it is clear that SL-PRS resource should not include symbols with PSCCH, PSSCH DMRS and PSSCH in shared resource pool.- the comb size of a SL-PRS resource - the comb offset of a SL-PRS resource - the starting symbol of a SL-PRS resource and number of symbols of a SL-PRS resource |