**3GPP TSG RAN WG1 #102-e R1-20xxxxx**

**e-Meeting, August 17th – 28th, 2020**

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**Source:** Moderator (LG Electronics)

**Title:** Text proposal from Email discussion thread #2 for AI 7.2.4.5 Physical layer procedures for sidelink

**Document for:** Discussion and decision

# **Introduction and proposal**

RAN1 made the agreements copied in Appendix in [102-e-NR-5G\_V2X\_NRSL-SL\_PHY\_Procedure-02] Email discussion/approval regarding the assumptions for the CSI reference resource for sidelink CSI. It is proposed to adopt the text proposal in Section 2 for the following reasons:

* Reason for change: RAN1 made the agreements to complete the UE assumption of the sidelink CSI reference resource. The text proposal is to implement these agreements.
* Summary of change: UE assumptions are added regarding the numerology, redundancy version, resources of PSCCH and PSSCH, resources and power of reference signals, and precoding of the sidelink CSI reference resource.
* Consequences if not approved: Assumptions used in sidelink CSI may be misaligned between the UEs and the accuracy of sidelink CSI reporting cannot be ensured.

# **Text proposal**

* 1. Text proposal for TS 38.214

===========================<Start of change #1>=======================

8.5.2.3 CSI reference resource definition

The CSI reference resource in sidelink is defined as follows:

- In the frequency domain, the CSI reference resource is defined by the group of sidelink physical resource blocks containing the sidelink CSI-RS to which the derived CSI relates.

- In the time domain, the CSI reference resource for a CSI reporting in sidelink slot *n* is defined by a single sidelink slot *nCSI\_ref* where *nCSI\_ref* is the same sidelink slot as the corresponding CSI request.

If configured to report CQI index and RI index, in the CSI reference resource, the UE shall assume the following for the purpose of deriving the CQI index and RI index:

- The reference resource uses the CP length and subcarrier spacing configured for the SL BWP.

- Redundancy Version 0.

- PSCCH occupies 2 OFDM symbols.

- The number of PSSCH and DMRS symbols is equal to *sl-LenghSymbols*‒2.

- Assume no REs allocated for sidelink CSI-RS.

- Assume no REs allocated SCI format 2-A or SCI format 2-B.

- Assume the same number of DM-RS symbols as the smallest one configured by the higher layer parameter *sl-PSSCH-DMRS-TimePatternList.*

- Assume no REs allocated for sidelink PT-RS.

- Assume sidelink CSI-RS RE power is the same as PSCCH RE power.

- The PSSCH transmission scheme where the UE may assume that PSSCH transmission would be performed with up to 2 transmission layers as defined in Clause 8.3.1.4 of [4, TS 38.211]. For CQI calculation, the UE should assume that PSSCH signals on antenna ports in the set [1000,…, 1000+ν-1] for ν layers would result in signals equivalent to corresponding symbols transmitted on antenna ports [3000,…, 3000+*P*-1], as given by

 $\left[\begin{array}{c}y^{\left(3000\right)}(i)\\\cdots \\y^{\left(3000+P-1\right)}(i)\end{array}\right]=W(i)\left[\begin{array}{c}x^{\left(0\right)}(i)\\\cdots \\x^{\left(ν-1\right)}(i)\end{array}\right]$

where  is a vector of PSSCH symbols from the layer mapping defined in Clause 8.3.1.4 of [4, TS 38.211], $P\in \left[1,2\right]$ is the number of CSI-RS ports. If only one CSI-RS port is configured, *W(i)* is 1. Otherwise, *W(i)* is the identity matrix*.*

============================<End of change #1>=======================

# **Appendix: Agreements made in the email discussion [102-e-NR-5G\_V2X\_NRSL-SL\_PHY\_Procedure-02]**

Agreements:

* UE assumes the following for the sidelink CSI reference resource:
	+ A1) Numerology (CP length and SCS) of configured SL BWP is used
	+ A2) RV0 is used.
	+ A3) PSCCH occupies
		- Option 1: 2 OFDM symbols
		- Option 2: timeResourcePSCCH OFDM symbols and frequencyResourcePSCCH PRBs in the resource pool
	+ A4) the number of PSSCH and DM-RS symbols is
		- Option 1: 10
		- Option 2: sl-LengthSymbols ‒ 2
	+ A5) No CSI-RS mapping REs
	+ A6) No 2nd SCI mapping REs
	+ A7) Smallest number of PSSCH DMRS symbols per (pre)confiugraiton
	+ A8) No sidelink PT-RS
	+ A9) Precoding is applied by 8.3.1.4 of TS 38.211.
	+ A10) NZP CSI-RS RE power is the same as PSSCH RE power.
* Note: the (pre)configuration in the assumptions means that of the resource pool where the CSI-RS is measured.

Agreements:

* A3: option 1
* A4: option 2