**3GPP TSG RAN WG1 #107-e R1-210xxxx**

**e-Meeting,** **November 11th – 19th, 2021**

Agenda Item: 7.2.5

Source: Moderator (vivo)

Title: Summary of email discussion [107-e-NR-L1enh-URLLC-03] on issues related to SRS resource sets configured for DCI format 0\_1 and DCI format 0\_2

Document for: Discussion and Decision

1. Introductions

This document provides the summary for the following email discussion:

[107-e-NR-L1enh-URLLC-03] Discussion on issues related to SRS resource sets configured for DCI format 0\_1 and DCI format 0\_2 by Nov 17– Zhi Lu (vivo)

This email thread is triggered by the following contribution.

* R1-2110988 Discussion on issues related to SRS resource sets configured for DCI format 0\_1 and DCI format 0\_2 vivo

Section 2 provides the background information. Section 3 captures the detailed email discussions. Section 4 summarizes the outcome of the email discussion.

1. Background

In the RAN1 #105-e and RAN1 #106-e meeting, agreements were made that the SRS resource set with *usage* set to '*codeBook*' or '*nonCodeBook*' configured in *srs-ResourceSetToAddModListDCI-0-2* composes of the first *N* SRS resources together with other parameters except for the higher layer parameters *‘srs-ResourceSetId’* and *‘srs-ResourceIdList’* from the associated SRS resource set configured in *srs-ResourceSetToAddModList*[1].

PL-RS is configured per SRS resource set and can be updated by MAC CE. If UE receives a MAC CE updating PL-RS for one SRS resource set, current specification does not clarify whether the transmit power for the SRS resource in the second resource set is updated or not. As shown in Figure 1, SRS resource 1 associated with both SRS resource set 1 configured in *srs-ResourceSetToAddModList* and SRS resource set 2 configured in *srs-ResourceSetToAddModListDCI-0-2.* When UE receives MAC CE 1, UE updates transmit power of PL-RS for SRS resource set 1. There is ambiguity whether power control parameters for SRS resource set 2 is also updated simultaneously as mentioned above.

To solve this problem, when UE receives a MAC CE carries any SRS resource set ID of two SRS resource sets to update PL-RS, the PL-RS for SRS resource set configured in *srs-ResourceSetToAddModList* and the associated SRS resource set configured in *srs-ResourceSetToAddModListDCI-0-2* can be updated simultaneously.



1. SRS Pathloss Reference RS Update MAC CE

Similar case also occurs for spatial relation indication or update for these two SRS resource sets. When two MAC CEs indicate spatial relation for SRS resources in two SRS resource sets, for these SRS resources configured in both SRS resource set configured in *srs-ResourceSetToAddModList* and *srs-ResourceSetToAddModListDCI-0-2*, if different spatial relations are indicated, UE cannot determine which spatial relation from the two MAC CEs is used.

To solve this problem, when UE receives a MAC CE to update spatial relation of SRS resources, the spatial relation of SRS resources with the same SRS resource ID from the SRS resource set configured in *srs-ResourceSetToAddModList* and the associated SRS resource set configured in *srs-ResourceSetToAddModListDCI-0-2* can be updated simultaneously.

1. Email Discussions

Companies are encouraged to provide comments on the following proposals.

Proposal 1: PL-RS for SRS resource set with usage set to '*codeBook*' or '*nonCodeBook*' configured in *srs-ResourceSetToAddModList* and the associated SRS resource set configured in *srs-ResourceSetToAddModListDCI-0-2* is updated simultaneously when UE receives a MAC CE carries any SRS resource set ID of these two SRS resource sets to update the PL-RS.

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| **Company** | **Agree? (Y/N)** | **Comments** |
| Qualcomm | Agree | As discussed in previous RAN1 meetings, the SRS resources set contained in *srs-ResourceSetToAddModListDCI-0-2* with usageset to *“codebook” or “noncodebook”* shall contain the first N entries of the SRS resource set contained in *srs-ResourceSetToAddModList* with the same usage. Thus if a parameter for the SRS resources in one set gets updated via MAC-CE, it is reasonable to apply the same update to the SRS resources in the other set.  |
|  OPPO | Agree |  |
| Nokia/NSB | Agree | These two SRS resource sets are not really ‘different’ SRS resource sets as such, as one is nothing but a subset of the other one. Thus, a PL-RS update should be applicable to both SRS resource sets.  |
| DOCOMO | Agree |  |
| HW/HiSi | Agree | Agree with the comment from Nokia, because one SRS resource set is a sub-set of the other, it should be “natural” to update both. |
| ZTE | Agree | We share the same view with Nokia and Huawei. |
| vivo | Agree |  |
| Intel | Agree |  |
| Apple |  | Should the set associated with DCI format 0\_1 be considered “primary” and the set with 0\_2 “secondary”? Then MAC CE update should apply to the set with 0\_1 only, and the update applies automatically to that with 0\_2. *>> Feature lead*We think there is no need to consider “primary” and “secondary” because if MAC CE update PL-RS for the set with DCI format 0\_2, the update also can apply automatically to that with 0\_1. |
| Ericsson | Agree with the intention | We agree with the intention that PL-RS is to be updated simultaneously since *srs-ResourceSetToAddModListDCI-0-2* simply refers to the first 𝑁𝑆𝑆𝑆 ,0\_2 SRS resources provided by *srs-ResourceSetToAddModList*. But the proposal says MAC CE can carry “any SRS resource set ID of these two”. Since *srs-ResourceSetToAddModListDCI-0-2* depends on *srs-ResourceSetToAddModList*, and not the other way around, we suggest to modify the proposal as follows:Modified Proposal 1: PL-RS for SRS resource set with usage set to '*codeBook*' or '*nonCodeBook*' configured in *srs-ResourceSetToAddModList* and the associated SRS resource set configured in *srs-ResourceSetToAddModListDCI-0-2* is updated simultaneously when UE receives a MAC CE carries a SRS resource set ID of *srs-ResourceSetToAddModList* to update the PL-RS.*>> Feature lead*If the modified proposal is applied, additional restriction is introduced that only MAC CE carrying SRS resource set ID from *srs-ResourceSetToAddModList* can be sent to UE to update PL-RS for both SRS resource sets in *srs-ResourceSetToAddModListDCI-0-2* and *srs-ResourceSetToAddModList*. It seems to prohibit NW sending the update command for PL-RS associated SRS resource set in sr*s-ResourceSetToAddModListDCI-0-2* by MAC CE*.*We think there is no need to introduce such restriction for NW. |
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**FL recommendation:** The proposal is stable.

Proposal 2: The spatial relation of SRS resources with the same SRS resource ID from the SRS resource set with usage set to ‘*codeBook*’ or ‘*nonCodeBook*’ configured in *srs-ResourceSetToAddModList* and the associated SRS resource set configured in *srs-ResourceSetToAddModListDCI-0-2* are updated simultaneously when UE receives a MAC CE carries any SRS resource set ID of these two SRS resource sets to update the spatial relation of the SRS resources.

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| **Company** | **Agree? (Y/N)** | **Comments** |
| Qualcomm | Agree | Same comments above.Furthermore, it appears to us that this proposal is already captured in the 38.212 CR agreed in previous meetings in:“… the SRS resource set is composed of the first 𝑁𝑆𝑅𝑆,0\_2 SRS resources together with other configurations in the SRS resource set configured by higher layer parameter srs-ResourceSetToAddModList …”In particular, the highlighted part implies that if other configurations (e.g., the spatial relation) for an SRS resource in one set gets updated via MAC-CE, the UE shall apply the same configuration to the SRS resource (with the same SRS resource ID) in the second set.  |
|  OPPO | Agree |  |
| Nokia/NSB | Agree | Similar comment as above.  |
| DOCOMO | Agree |  |
| HW/HiSi | Agree | Same comment as above. |
| ZTE | Agree |  |
| vivo | Agree | The main intention of the proposal is to achieve a common understanding among companies. |
| Intel | Agree |  |
| Ericsson | NO | This proposal is confusing and not needed.In our understanding, both SRS resource set call the same SRS resource ID. There is only one entity (SRS resource with a SRS-ResourceId), and this one entity is called by two sets via the SRS-ResourceId. When MAC updates this one entity, it certainly applies to the two sets that calls for this one entity. But there are no two entities to be simultaneously updated.Thus we don’t think this proposal is needed. In fact, it creates the misunderstanding that somehow there are two different SRS resources with a same SRS-ResourceId, one for each set. Note that the MAC CE for spatial relation update (Proposal 2) is different from MAC CE for path loss reference RS (Proposal 1).* For path loss reference RS: this is a parameter for a SRS-ResourceSet. Thus for two SRS resource sets, there are two PL RS which can be required to be updated simultaneously.
* For spatial relationship: this is a parameter for SRS-Resource. Thus even though there are two SRS resource sets, they call for a single SRS resource. Hence no two entities to be updated simultaneously.

*>> Feature lead*Based on the description in TS 38.321, the spatial relation is indicated/updated for SRS resource in the SRS resource set identified by SRS resource set ID. There is ambiguity for MAC entity when two MAC CE carrying two SRS resource set ID to update different spatial relations for the SRS resource configured in both SRS resource sets are received, because for the only one SRS resource entity, UE does not know which one of the two spatial relations is used. This proposal ensures only one spatial relation is indicated/updated for the same SRS resource entity in such case.

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| TS 38.3216.1.3.17 SP SRS Activation/Deactivation MAC CEThe SP SRS Activation/Deactivation MAC CE is identified by a MAC subheader with LCID as specified in Table 6.2.1-1. It has a variable size with following fields:…….-Fi: This field indicates the type of a resource used as a spatial relationship for SRS resource within SP/AP SRS Resource Set indicated with SP/AP SRS Resource Set ID field. F0 refers to the first SRS resource within the resource set, F1 to the second one and so on. The field is set to 1 to indicate NZP CSI-RS resource index is used, and it is set to 0 to indicate either SSB index or SRS resource index is used. The length of the field is 1 bit. This field is only present if MAC CE is used for activation of SP SRS resource set, i.e. the A/D field is set to 1, or for AP SRS resource set; |

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**FL recommendation:** The proposal is stable.

1. Outcome of the Email Discussion

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References

1. 3GPP TS 38.212 V16.7.0, Multiplexing and channel coding (Release 16), 2021-09.

Appendix Agreements in the past meetings

[1] R1-2106364 Correction on SRS resource set configuration in TS 38.212, RAN 1#105e-meeting

[2] R1-2106365 Correction on SRS resource set configuration in TS 38.214, RAN 1#105e- meeting

[3] [R1-2108470](file:///C%3A%5CUsers%5Cyouns%5COneDrive%5CDocuments%5C3GPP%5CRAN1%20tdocs%5CTSGR1_106-e%5CDocs%5CR1-2108470.zip) Correction on SRS resource set configuration for DCI format 0\_2 in TS 38.212, RAN 1#106e-meeting