**3GPP TSG RAN WG1 #110 R1-2206783**

**Toulouse, France, August 22nd – 26th, 2022**

**Agenda item:** 7.2.6

**Source:** Moderator (ASUSTeK)

**Title:** Summary for R1-2207502

**Document for:** Discussion and Decision

1. Introduction

This document collects company views on a RAN1#110 submitted draft CR attempting to clarify PL RS for PUSCH scheduled by DCI format 0\_0 when UE is not provided PUCCH spatial setting but is provided with *enableDefaultBeamPL-ForPUSCH0-0*. Since condition check for determining PL RS for PUSCH scheduled by DCI format 0\_0 from following two paragraph in TS 38.213 will satisfy, it’s not clear which paragraph is used for determining PL RS.

**(First paragraph in TS 38.213)**

- If

- the PUSCH transmission is scheduled by DCI format 0\_0 and the UE is not provided a spatial setting for a PUCCH transmission, or

…

the UE determines a RS resource index with a respective *PUSCH-PathlossReferenceRS-Id* value being equal to zero where the RS resource is either on serving cell or, if provided, on a serving cell indicated by a value of *pathlossReferenceLinking*

**(Third paragraph in TS 38.213)**

- If

- the PUSCH transmission is scheduled by DCI format 0\_0 on serving cell ,

- the UE is not provided a spatial setting for PUCCH resources on the active UL BWP of the primary cell [11, TS 38.321], and

- the UE is provided *enableDefaultBeamPL-ForPUSCH0-0*

the UE determines a RS resource index providing a periodic RS resource configured with *qcl-Type* set to 'typeD' in the TCI state or the QCL assumption of a CORESET with the lowest index in the active DL BWP of the serving cell

The proposed change below is to clarify that “first paragraph in TS 38.213” covers only FR1. Thus, when UE is not provided a spatial setting for a PUCCH transmission but is provided with *enableDefaultBeamPL-ForPUSCH0-0*, which is only enabled in FR2, there is no ambiguity since condition check of the first paragraph will not pass.

**The proposed change and surrounding paragraph:**

- If

- the PUSCH transmission is scheduled by DCI format 0\_0 and the UE is not provided a spatial setting for a PUCCH transmission in FR1, or

- the PUSCH transmission is scheduled by DCI format 0\_1 or DCI format 0\_2 that does not include an SRI field, or

- *SRI-PUSCH-PowerControl* is not provided to the UE,

the UE determines a RS resource index with a respective *PUSCH-PathlossReferenceRS-Id* value being equal to zero where the RS resource is either on serving cell or, if provided, on a serving cell indicated by a value of *pathlossReferenceLinking*

**An alternating proposal suggested by LG:**

- If

- the UE is not provided *enableDefaultBeamPL-ForPUSCH0-0* and the PUSCH transmission is scheduled by DCI format 0\_0 and the UE is not provided a spatial setting for a PUCCH transmission, or

- the PUSCH transmission is scheduled by DCI format 0\_1 or DCI format 0\_2 that does not include an SRI field, or

- *SRI-PUSCH-PowerControl* is not provided to the UE,

the UE determines a RS resource index with a respective *PUSCH-PathlossReferenceRS-Id* value being equal to zero where the RS resource is either on serving cell or, if provided, on a serving cell indicated by a value of *pathlossReferenceLinking*

1. Company’s view

Company’s view are summarized below.

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| --- | --- |
| **Companies** | **Company inputs (if any)** |
| ASUSTeK | We found there is a third paragraph which we shall reference rather than second paragraph. Sorry for confusion.  When UE is not provided a spatial setting for a PUCCH transmission in FR2 but is provided with enableDefaultBeamPL-ForPUSCH0-0 set 'enabled', since there are two paragraph below in TS 38.213 for determining PL RS for PUSCH scheduled by DCI format 0\_0, the ambiguity issue still exists between first paragraph and third paragraph.  **(First paragraph in TS 38.213)**  - If  - the PUSCH transmission is scheduled by DCI format 0\_0 and the UE is not provided a spatial setting for a PUCCH transmission, or  …  the UE determines a RS resource index with a respective *PUSCH-PathlossReferenceRS-Id* value being equal to zero where the RS resource is either on serving cell or, if provided, on a serving cell indicated by a value of *pathlossReferenceLinking*  **(Third paragraph in TS 38.213)**  - If  - the PUSCH transmission is scheduled by DCI format 0\_0 on serving cell ,  - the UE is not provided a spatial setting for PUCCH resources on the active UL BWP of the primary cell [11, TS 38.321], and  - the UE is provided *enableDefaultBeamPL-ForPUSCH0-0*  the UE determines a RS resource index providing a periodic RS resource configured with *qcl-Type* set to 'typeD' in the TCI state or the QCL assumption of a CORESET with the lowest index in the active DL BWP of the serving cell |
| LG | Thanks ASUSTek for further clarification. Second FL’s note is added based on the clarification.  FL note2: Based on ASUSTek’s further clarification, this issue seems valid and could be treated as ‘H’. Better way of correction may be …  - If  - the UE is not provided *enableDefaultBeamPL-ForPUSCH0-0* and the PUSCH transmission is scheduled by DCI format 0\_0 and the UE is not provided a spatial setting for a PUCCH transmission, or  - the PUSCH transmission is scheduled by DCI format 0\_1 or DCI format 0\_2 that does not include an SRI field, or  - *SRI-PUSCH-PowerControl* is not provided to the UE,  the UE determines a RS resource index with a respective *PUSCH-PathlossReferenceRS-Id* value being equal to zero where the RS resource is either on serving cell or, if provided, on a serving cell indicated by a value of *pathlossReferenceLinking* |
| Qualcomm | The spec is correct to our understanding. It is meant for FR2. There is no conflict between 213 and 214 |
| Lenovo | Not needed. Agree with FL’s assessment |
| ZTE | Not needed. As a general requirement, if *enableDefaultBeamPL-ForPUSCH0-0* is provided, the UE behavior under the third paragraph should be performed, otherwise, the first paragraph is performed. |
| Google | The change looks incorrect and unnecessary. Spatial setting and default beam are only applicable for FR2. |
| Apple | It seems to be minor issue for us based on further clarification from ASUSTek. The third paragraph, i.e., when enableDefaultBeamPL-ForPUSCH0-0 is provided, proceeds the first paragraph. But we are open to have some discussion. |
| Nokia/NSB | Not needed, the use of spatial settings in FR2, hence the negation of this for FR1, is rather clear. |
| ASUSTeK/Moderator | @all, above are current received company’s comments from previous Samsung’s summary. Samsung’s original summary is referenced in Appendix. Please check if we miss your comments.  @LG, we are also fine with your suggested change.  @Qualcomm, could you clarify what is meant for FR2, e.g. “First paragraph” quoted above? Probably we could firstly focus on ambiguity issue between first paragraph and third paragraph in TS 38.213 raised above due to the fact that FR2 without PUCCH spatial settings but with *enableDefaultBeamPL-ForPUSCH0-0* satisfy condition of current both first and third paragraph in TS 38.213. Would you be fine with the amendment LG suggested?  @ZTE, can we clarify what you described is RAN1 common understanding? Given the first paragraph is silent on whether *enableDefaultBeamPL-ForPUSCH0-0* is provided or not, it’s difficult to interpret the spec in a way that the first paragraph only applies to the case *enableDefaultBeamPL-ForPUSCH0-0* is not provided. From our point of view, we think this change is a simple fix to make spec clear.  @Google, motivation of the proposed change is to clarify that the first paragraph in TS 38.213 merely concerned that “UE is not provided a spatial setting for PUCCH resources and *enableDefaultBeamPL-ForPUSCH0-0* is not provided”. It’s our opinion that without this change, when UE is not configured PUCCH spatial setting and provided with *enableDefaultBeamPL-ForPUSCH0-0* in FR2, condition of both current first paragraph and third paragraph quoted above in TS 38.213 will satisfy which results in ambiguity. Would you be fine with the amendment LG suggested?  @Nokia,  According to 6.1.1 in TS 38.214,  Except if the higher layer parameter *enableDefaultBeamPL-ForPUSCH0-0* is set 'enabled', the UE shall not expect PUSCH scheduled by DCI format 0\_0 in a BWP without configured PUCCH resource with *PUCCH-SpatialRelationInfo* in frequency range 2 in RRC connected mode.  It’s our understanding that when UE is provided with *enableDefaultBeamPL-ForPUSCH0-0* (which is enabled in FR2), the UE could be not configured with PUCCH spatial settings. So, there is case of no PUCCH spatial settings in FR2.  Other company’s input on this issue is appreciated. Thank you. |

1. Discussion and proposal

From the inputs shared by participating companies during the preparation phase, the following **observation** can be made:

* The following issue can be handled as E (a part of editorial CR):
* The following issues can be designated as H (requiring discussion and additional agreements/conclusions):

The following **proposals** are made:

* RAN1#110 email thread assignment for the maintenance on Rel-16 NR\_eMIMO:
  + Email thread 1 ...
  + Email thread 2 ...

# References

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| 1 | [**R1-2207502**](https://www.3gpp.org/ftp/TSG_RAN/WG1_RL1/TSGR1_110/Docs/R1-2207502.zip) | Correction on PL RS determination for PUSCH scheduled by DCI format 0\_0 | ASUSTeK |
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# Appendix

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| **#** | **Issue (summary of CR proposal)** | **Companies** | **Initial assessment** | **Company inputs (if any)** |
| MB.1 | R1-2207502: Change the condition “the UE is not provided a spatial setting for a PUCCH transmission” to “the UE is not provided a spatial setting for a PUCCH transmission in FR1” in 6.1.1 of TS 38.213.  FL note: Not needed. There is no contradiction/ambiguity in current specification because ‘the UE is not provided a spatial setting for a PUCCH transmission’ in the first paragraph means that ‘UE is provided PUCCH resources but with no spatial setting configured’ and the R16 default beam/PLRS mode described in the second paragraph includes that ‘the UE is not provided PUCCH resources for the active UL BWP of serving cell c’  FL note2: Based on ASUSTek’s further clarification, this issue seems valid and could be treated as ‘H’. Better way of correction may be …  - If  - the UE is not provided *enableDefaultBeamPL-ForPUSCH0-0* and the PUSCH transmission is scheduled by DCI format 0\_0 and the UE is not provided a spatial setting for a PUCCH transmission, or  - the PUSCH transmission is scheduled by DCI format 0\_1 or DCI format 0\_2 that does not include an SRI field, or  - *SRI-PUSCH-PowerControl* is not provided to the UE,  the UE determines a RS resource index with a respective *PUSCH-PathlossReferenceRS-Id* value being equal to zero where the RS resource is either on serving cell or, if provided, on a serving cell indicated by a value of *pathlossReferenceLinking* | ASUSTeK | N | [ASUSTeK] We found there is a third paragraph which we shall reference rather than second paragraph. Sorry for confusion.  When UE is not provided a spatial setting for a PUCCH transmission in FR2 but is provided with enableDefaultBeamPL-ForPUSCH0-0 set 'enabled', since there are two paragraph below in TS 38.213 for determining PL RS for PUSCH scheduled by DCI format 0\_0, the ambiguity issue still exists between first paragraph and third paragraph.  **(First paragraph in TS 38.213)**  - If  - the PUSCH transmission is scheduled by DCI format 0\_0 and the UE is not provided a spatial setting for a PUCCH transmission, or  …  the UE determines a RS resource index with a respective *PUSCH-PathlossReferenceRS-Id* value being equal to zero where the RS resource is either on serving cell or, if provided, on a serving cell indicated by a value of *pathlossReferenceLinking*  **(Third paragraph in TS 38.213)**  - If  - the PUSCH transmission is scheduled by DCI format 0\_0 on serving cell ,  - the UE is not provided a spatial setting for PUCCH resources on the active UL BWP of the primary cell [11, TS 38.321], and  - the UE is provided *enableDefaultBeamPL-ForPUSCH0-0*  the UE determines a RS resource index providing a periodic RS resource configured with *qcl-Type* set to 'typeD' in the TCI state or the QCL assumption of a CORESET with the lowest index in the active DL BWP of the serving cell  [LG/FL] Thanks ASUSTek for further clarification. Second FL’s note is added based on the clarification.  [Qualcomm]: The spec is correct to our understanding. It is meant for FR2. There is no conflict between 213 and 214  [Lenovo] Not needed. Agree with FL’s assessment  [ZTE]: Not needed. As a general requirement, if *enableDefaultBeamPL-ForPUSCH0-0* is provided, the UE behavior under the third paragraph should be performed, otherwise, the first paragraph is performed.  [Google]: The change looks incorrect and unnecessary. Spatial setting and default beam are only applicable for FR2.  [Apple] It seems to be minor issue for us based on further clarification from ASUSTek. The third paragraph, i.e., when enableDefaultBeamPL-ForPUSCH0-0 is provided, proceeds the first paragraph. But we are open to have some discussion.  [Nokia/NSB] Not needed, the use of spatial settings in FR2, hence the negation of this for FR1, is rather clear. |