**3GPP TSG RAN WG1 #101 R1-200xxxx**

**e-Meeting, May 25th – June 5th, 2020**

**Agenda item:** 7.2.6.3.

**Source:** Moderator (LG Electronics)

**Title:** Summary of email thread [101-e-NR-eMIMO-MB1-02]

**Document for:** Discussion and Decision

# Introduction

This contribution summaries discussion in email thread [101-e-NR-eMIMO-MB1-02]

# Discussion

# Correct/align description for Tx beam determination for the default spatial relation

Motivation: When the default spatial relation is enabled, for PUSCH, it is described as “the UE shall transmit PUSCH according to the spatial relation, if applicable, with a reference to the RS with ‘QCL-TypeD’ corresponding to the QCL assumption of the CORESET with the lowest ID ...” but for SRS, it is described as “the UE shall transmit the target SRS resource with the same spatial domain transmission filter used for the reception of the CORESET...”

***TP from ZTE: {****38.214: 6.2.1 UE sounding procedure}*

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| When the higher layer parameter *enableDefaultBeamPlForSRS* is set ‘enabled’, and if the higher layer parameter *spatialRelationInfo* for the SRS resource, except for the SRS resource with the higher layer parameter *usage* in SRS-ResourceSet set to 'beamManagement' or for the SRS resource with the higher layer parameter *usage* in SRS-ResourceSet set to ‘nonCodebook’ with configuration of *associatedCSI-RS* or for the SRS resource configured by the higher layer parameter [SRS-for-positioning], is not configured in FR2 and if the UE is not configured with higher layer parameter(s) *pathlossReferenceRS*, and if the UE is not configured with different values of *CORESETPoolIndex* in *ControlResourceSets*, and is not provided at least one TCI codepoint mapped with two TCI states, the UE shall transmit the target SRS resource in an active UL BWP of a CC- according to the spatial relation, if applicable, with a reference to the RS with ‘QCL-TypeD’ corresponding to the QCL assumption of the CORESET with the lowest *controlResourceSetId* in the active DL BWP in the CC.- according to the spatial relation, if applicable, with a reference to the RS with ‘QCL-TypeD’ in the activated TCI state with the lowest ID applicable to PDSCH in the active DL BWP of the CC if the UE is not configured with any CORESET in the active DL BWP of the CC |

**Companies’ view (to be updated)**

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# Editorial correction on simultaneous multi-CC TCI update

Motivation: For the sake of presentation, the “the indicated CCs” are unclear, especially considering that there is a description of “indicated CC” before that.

***TP from ZTE: {****38.214: 5.1.5 Antenna ports quasi co-location}*

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| The UE receives an activation command, as described in clause 6.1.3.14 of [10, TS 38.321], used to map up to 8 TCI states to the codepoints of the DCI field *'Transmission Configuration Indication'* in one CC/DL BWP or in a set of CCs/DL BWPs, respectively. When a set of TCI state IDs are activated for a set of CCs/DL BWPs, where the applicable list of CCs is determined by indicated CC in the activation command, the same set of TCI state IDs are applied for all DL BWPs in the applicable list of CCs.  |

**Companies’ view (to be updated)**

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# Capture that the feature of simultaneous TCI/spatial relation update is applicable only for single TRP case

Motivation: For simultaneous beam update across multiple CCs, it was agreed that this feature is at least applied to single TRP case. However, this condition is not captured in current spec.

**Proposal from Qualcomm: Clarify that simultaneous beam update for multiple CCs is only applicable to single TRP case.**

The corresponding TP for PDSCH

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| 38.214->5.1.5 Antenna ports quasi co-location[…]The UE receives an activation command, as described in clause 6.1.3.14 of [10, TS 38.321] or in clause [6.1.3.x] of [10, TS 38.321], used to map up to 8 TCI states to the codepoints of the DCI field *'Transmission Configuration Indication'* in one CC/DL BWP or in a set of CCs/DL BWPs, respectively. When a set of TCI state IDs are activated for a set of CCs/DL BWPs, where the applicable list of CCs is determined by indicated CC in the activation command, the same set of TCI state IDs are applied for all DL BWPs in the indicated CCs. A set of TCI state IDs can be activated for a set of CCs/DL BWPs only if UE is not provided different values of CORESETPoolIndex in ControlResourceSets, and is not provided at least one TCI codepoint mapped with two TCI states.[…] |

The corresponding TP for PDCCH

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| 38.213->10.1 UE procedure for determining physical downlink control channel assignment[…]if the UE is provided by simultaneousTCI-CellList a number of up to two lists of cells for simultaneous TCI state activation by simultaneousTCI-UpdateList-r16 and/or simultaneousTCI-UpdateListSecond-r16, the UE applies the antenna port quasi co-location provided by TCI-States with same activated tci-StateID value to CORESETs with index 𝑝 in all configured DL BWPs of all configured cells in a list determined from a serving cell index provided by a MAC CE command. The simultaneousTCI-CellList can be provided for simultaneous TCI state activation only if UE is not provided different values of CORESETPoolIndex in ControlResourceSets, and is not provided at least one TCI codepoint mapped with two TCI states.[…] |

The corresponding TP for SP/AP SRS

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| 38.214-> 6.2.1 UE sounding procedure[…]When a spatialRelationInfo is activated/updated for a semi-persistent or aperiodic SRS resource configured by the higher layer parameter SRS-Resource by a MAC CE for a set of CCs/BWPs, where the applicable list of CCs is indicated by higher layer parameter simultaneousSpatial-UpdatedList-r16 or simultaneousSpatial-UpdatedListSecond-r16, the spatialRelationInfo is applied for the semi-persistent or aperiodic SRS resource(s) with the same SRS resource ID for all the BWPs in the indicated CCs. A spatialRelationInfo can be activated/updated for a semi-persistent or aperiodic SRS resource configured by the higher layer parameter SRS-Resource by a MAC CE for a set of CCs/BWPs only if UE is not provided different values of CORESETPoolIndex in ControlResourceSets, and is not provided at least one TCI codepoint mapped with two TCI states.[…] |

**Companies’ view (to be updated)**

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# Capture that UE expects to be configured with *sri-PUSCH-PowerControl* when the MAC-CE based PL RS update is enabled for PUSCH that does not include a SRI field

Motivation: The last sentence of the captured agreement is not captured in current specification.

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| **Agreement in RAN1#99**When *enablePLRSupdateForPUSCHSRS* is configured, if a grant-based or grant-free PUSCH transmission is scheduled/activated by DCI format 0\_1 that does not include a SRI field, the RS resource index *qd* corresponding to the *PUSCH-PathlossReferenceRS-Id* mapped with *sri-PUSCH-PowerControlId* = 0 is used for path-loss measurement of PUSCH transmission. In this case, UE expects to be configured with *sri-PUSCH-PowerControl* |

**Proposal from CATT**: *Capture RAN1#99 agreement that UE expects to be configured with sri-PUSCH-PowerControl to determine RS resource index qd which will be used for path-loss measurement of PUSCH transmission. When enablePLRSupdateForPUSCHSRS is configured and if a grant-based or grant-free PUSCH transmission is scheduled/activated by DCI format 0\_1 that does not include a SRI field.*

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| TS38.213: 7.1.1 UE behavior-----Start TP------ For a PUSCH transmission scheduled by a DCI format that does not include a SRI field, or for a PUSCH transmission configured by *ConfiguredGrantConfig* and activated, as described in Clause 10.2, by a DCI format that does not include a SRI field, a RS resource index  is determined from the *PUSCH-PathlossReferenceRS-Id* mapped to *sri-PUSCH-PowerControlId* = 0. The UE expects to be configured with *sri-PUSCH-PowerControl.*-----End TP----- |

**Companies’ view (to be updated)**

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# Conclusion (to be updated)

From the email discussion [101-e-NR-eMIMO-MB1-02], xxx

# References

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| --- | --- | --- |
| **TDoc** | **Title** | **Source** |
| [**R1-2003470**](http://www.3gpp.org/ftp/TSG_RAN/WG1_RL1/TSGR1_101-e/Docs/R1-2003470.zip) | Maintenance of multi-beam operation | ZTE |
| [**R1-2003628**](http://www.3gpp.org/ftp/TSG_RAN/WG1_RL1/TSGR1_101-e/Docs/R1-2003628.zip) | Remaining issues on multi-beam operation enhancement | CATT |
| [**R1-2004464**](http://www.3gpp.org/ftp/TSG_RAN/WG1_RL1/TSGR1_101-e/Docs/R1-2004464.zip) | Enhancements on Multi-beam Operation | Qualcomm Incorporated |