**3GPP TSG RAN WG1 #117 R1-24xxxxx R1-24xxxxx**

**Fukuoka, Japan,** May20th – May 25th, 2024

**Source: Moderator (CATT)**

**Title:** **Summary discussion Draft CR on UL TX spatial filter determination for SRS transmission in unified TCI framework**

**Agenda Item:** **7**

**Release: 17**

**WI code: NR\_FeMIMO-Core**

**Document for:** **Discussion and Decision**

1. **Introduction**

This contribution summarizes companies’view about draft CR on UL TX spatial filter determination for SRS transmission in unified TCI framework.

**Relevant contribution**

R1-2404362 Draft CR on UL TX spatial filter determination for SRS transmission in unified TCI framework CATT

**Reason for the change:**

In Rel-17 unified TCI framework, it was agreed that the UL TX spatial filter for an UL transmission associated with a joint TCI state/UL TCI state is derived from the RS of DL QCL-TypeD for the joint TCI state, or the RS in the UL TCI state. However, how to determine the UL TX spatial filter for the SRS resource(s) configured with a joint TCI state/UL TCI state is not specified in TS38.214.

**Summary of the change:**

Clarify that the UL TX spatial filter for the SRS resource(s) configured with a joint TCI state/UL TCI state is derived from the RS of DL QCL-TypeD for the joint TCI state, or the RS in the UL TCI state.

**The proposed change:**

### 6.2.1 UE sounding procedure

The UE may be configured with one or more Sounding Reference Signal (SRS) resource sets as configured by the higher layer parameter *SRS-ResourceSet* or *SRS-PosResourceSet*. For each SRS resource set configured by *SRS-ResourceSet*, a UE may be configured with SRS resources (higher layer parameter *SRS-Resource*), where the maximum value of K is indicated by UE capability[13, 38.306]. When SRS resource set is configured with the higher layer parameter *SRS-PosResourceSet,* a UE may be configured with *K* ≥1 SRS resources (higher layer parameter *SRS-PosResource*), where the maximum value of K is 16. The SRS resource set applicability is configured by the higher layer parameter *usage* in *SRS-ResourceSet.* When the higher layer parameter *usage* is set to 'beamManagement'*,* only one SRS resource in each of multiple SRS resource sets may be transmitted at a given time instant, but the SRS resources in different SRS resource sets with the same time domain behaviour in the same BWP may be transmitted simultaneously. For a given CC, multiple SRS resources across multiple sets with usage "beamManagement" are not expected to be partially overlapped in time.

For the SRS resource set(s) configured *in srs-ResourceSetToAddModListDCI-0-2* with higher layer parameter *usage* set to '*antennaSwitching*' or '*beamManagement*', the UE expects the same SRS resource set(s) with the same *usage* being configured in *srs-ResourceSetToAddModList.*

When the UE is configured *dl-OrJointTCI-StateList* or *ul-TCI-StateList,* the UE can assume that SRS resource(s) in any SRS resource set, except SRS resource set for positioning and an SRS resource set configured with *followUnifiedTCI-StateSRS*, can be configured with *TCI-State* or *TCI-UL-State* or updated as described in clause 6.1.3.59 or 6.1.3.60 of [10, TS 38.321]. If the *TCI-State* or *TCI-UL-State* is configured or updated for an SRS resource, the UE shall perform SRS transmission according to the spatial relation, if applicable, with a reference to the RS for determining UL TX spatial filter. The RS is determined based on an RS configured with *qcl-Type* set to 'typeD' of the indicated *TCI-State* or an RS in the indicated *TCI-UL-State*. The reference RS in the *TCI-State* can be a CSI-RS resource in a *NZP-CSI-RS-ResourceSet* configured with higher layer parameter *repetition*, or a CSI-RS resource in an *NZP-CSI-RS-ResourceSet* configured with higher layer parameter *trs-Info*. The reference RS in the *TCI-UL-State*(s) can be a CSI-RS resource in a *NZP-CSI-RS-ResourceSet* configured with higher layer parameter *repetition*, a CSI-RS resource in an *NZP-CSI-RS-ResourceSet* configured with higher layer parameter *trs-Info*, an SRS resource with the higher layer parameter *usage* set to 'beamManagement', or SS/PBCH block associated with the same or different PCI from the PCI of the serving cell.

If an SRS resource set, except an SRS resource set for positioning, is configured with *followUnifiedTCI-StateSRS*, the UE shall transmit the target SRS resource(s) within the SRS resource set according to the spatial relation, if applicable, with a reference to the RS used for determining UL TX spatial filter. The RS is determined based on an RS configured with *qcl-Type* set to 'typeD' in *QCL-Info* of the indicated *TCI-State* or an RS in the indicated *TCI-UL-State*. The reference RS in the indicated *TCI-State* can be a CSI-RS resource in a *NZP-CSI-RS-ResourceSet* configured with higher layer parameter *repetition*, or a CSI-RS resource in an *NZP-CSI-RS-ResourceSet* configured with higher layer parameter *trs-Info.* The reference RS in the indicated *TCI-UL-State* can be a CSI-RS resource in a *NZP-CSI-RS-ResourceSet* configured with higher layer parameter *repetition*, a CSI-RS resource in an *NZP-CSI-RS-ResourceSet* configured with higher layer parameter *trs-Info,* an SRS resource with the higher layer parameter *usage* set to 'beamManagement', or SS/PBCH block associated with the same or different PCI from the PCI of the serving cell.

<Unrelated parts are omitted>

1. **Discussion**

**Question 1:** Are you fine with the change proposed in [1]? If you have a concern, please explain. Do you have specific comments or revisions to the draft CR in [1]?

Please provide your comments on the proposal to the table below

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| Company | Comments |
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1. **References**
2. R1-2404362 Draft CR on UL TX spatial filter determination for SRS transmission in unified TCI framework CATT