**3GPP TSG RAN WG1 Meeting #108-e R1-220xxxx**

**e-Meeting, February 21 – March 3, 2022**

**Agenda Item: 8.1.4**

**Source: (Moderator) Huawei, HiSilicon**

**Title: Summary of CSI enhancements for MTRP and FDD (Round 1)**

**Document for: Discussion and Decision**

# Introduction

Enhancement on CSI measurement and reporting:

* Evaluate and, if needed, specify CSI reporting for DL multi-TRP and/or multi-panel transmission to enable more dynamic channel/interference hypotheses for NCJT, targeting both FR1 and FR2
* Evaluate and, if needed, specify Type II port selection codebook enhancement (based on Rel.15/16 Type II port selection) where information related to angle(s) and delay(s) are estimated at the gNB based on SRS by utilizing DL/UL reciprocity of angle and delay, and the remaining DL CSI is reported by the UE, mainly targeting FDD FR1 to achieve better trade-off among UE complexity, performance and reporting overhead

For Rel-17 CSI enhancement in RAN1 108-e, proposals are roughly classified as one of three categories to facilitate RAN1 meeting schedule and efficient RAN1 decisions:

* **Proposals of Further Enhancement:** some proposals need RAN1 high-level agreements/common understanding firstly before discussing associated TP draft. It is targeted to make a RAN1 decision during Week 1, to see any agreement can be made by Email (or GTW for exceptional cases). If does, we will translate the agreement into agreeable TP in Week 2 at least, i.e. there is no follow-up email discussion after March 3.
* **Text Proposals of Correction:** sometext proposals need RAN1 discussion firstly during Round 0, to see whether specification corrections are needed, like normal Rel-15/16 CR preparation phase. Companies are encouraged to share your views, and suggested changes if need in your view. We will consolidate CR draft and RAN1 comments in an agreeable TP during Week 1.
* **Text Proposals of Editorial Changes:** some text proposals might be obvious editorial changes, up to FL understanding, assuming that they are agreeable or straightforward at least. If not, they will be moved up for further RAN1 discussion. We will combine all editorial changes during Week 1.

# Summary of CSI enhancement for FDD

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| **Samsung** | **Proposal 3:** Regarding Rel.17 codebook parameters,* + allowed rank (via RI-restriction-r17) can’t be 3 or 4 when $α=\frac{1}{2}$ (i.e., paramCombination-r17=5) and $P\_{CSIRS}=4$
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| Company | Comments |
| **Mod** |  Let us discuss this issue raised by Samsung, to see whether we need an explicit restriction in RAN1 spec (or conclusion), or it is left to gNB’s discretion. Could you please share your view? Thank you! |
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# Summary of CSI enhancement for Multi-TRP

**Proposal 6: Additional restriction to decouple enhanced group-based beam reporting and enhanced multi-TRP CSI reporting**

This issue is raised by Ericsson in R1-2202276 as following:

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| **Company** | **View** |
| **Ericsson** | * The UE is not expected to be configured with higher layer parameter cmrGroupingAndPairing-r17 in an NZP CSI-RS resource set that is indicated as the second NZP CSI-RS resource set via higher layer parameter resourcesForChannel2 in CSI-AssociatedReportConfigInfo.
* For a higher layer parameter resourcesForChannelMeasurement configured with two Periodic or semiPersistent NZP CSI-RS resource sets, the UE is not expected to be configured with higher layer parameter cmrGroupingAndPairing-r17 in any of the two NZP CSI-RS resource sets.
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| Company | Comments |
| **Mod** | It seems to me that a conclusion may be needed at least, given company feedback, about whether above restriction is needed. If we can reach a conclusion to have explicit restrictions, please inform your RAN2 colleagues. How to take into account the conclusion in RAN2 design is up to RAN2. If we can’t, RAN2 can certainly have more freedom. Can you share your view for Ericsson’s suggestions in order to separate two Rel-17 features at RRC level? Thank you! |
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