**3GPP TSG RAN WG1 #109-e R1-2203852**

**e-Meeting, May 9th – 20th, 2022**

**Agenda item:** 7.2.6

**Source:** Moderator (Samsung)

**Title:** Summary for Rel.16 NR eMIMO maintenance

**Document for:** Discussion and Decision

1. Introduction

The moderator summary of the maintenance-related issues raised in the submitted contributions for Rel.16 NR\_eMIMO maintenance is given below. The listed maintenance issues are under the usual designations:

* LP: low-PAPR RS
* MB: Multi-beam operation
* MT: Multi-TRP
* MU: Type-II enhancement for MU-CSI
* UL: UL full power transmission
* O: Other

An initial assessment on each of the issues is given (but can be revised based on the outcome of the discussion during the preparation week). The assessment will be used as a basis to select four issues (per chairman instruction) for further discussion in the upcoming weeks.

* *High priority (H):* this includes high-priority item (essential, pending issues, broken spec components) and proposed editorial changes that either enhance the clarity of the specs or correct mistakes
* *Non-essential (N)*: this includes all other purposes such as spec optimization and low priority issues
* *Editorial (E)*: this includes editorial issues that will be handled as editorial CRs

1. Maintenance issues

The issues are summarized in the following table:

**Table 1 Summary**

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| **#** | **Issue (summary of CR proposal)** | **Companies** | **Initial assessment** | **Company inputs (if any)** |
| MT.1 | R1-2203272 proposed a TP for 38.213 to clarify that the pseudo code of type-2 HARQ feedback is performed for each TRP when m-DCI mTRP is configured. R1-2203272 suggested that the current text in 38.213 might cause some misunderstanding.  FL note: Seems to be good editorial change | ZTE | E | Apple: Okay with TP  Samsung: It seems that the current specification is clear.  QC: This does not seem to be necessary. “counting as two times” is used in other instances as well (unrelated to mTRP  ZTE: Supported FL-assessment. |
| MT.2 | R1-2204161 proposed TP for 38.213 to clarify UE behavior of counting DAI when joint type-2 HARQ for m-DCI TRP is configured and UE indicates *type2-HARQ-ACK-Codebook*. The TP proposes to clarify that in that case, for a same PDCCH monitoring occasion and a same serving cell, the DAI(s) of multiple PDSCHs scheduled by a first TRP are counted in increasing order of the PDSCH reception starting time, then the DAI(s) of multiple PDSCHs scheduled by a second TRP are counted in increasing order of the PDSCH reception starting time.  FL note: the text in TS38.213 specifies that the DAI is counted first for the 1st TRP and then the 2nd TRP in mDCI-based mTRP transmission. According to the specification, it can be understood that this rule is also applicable when the UE indicates by *type2-HARQ-ACK-Codebook* to support for multiple PDSCHs in mDCI-based mTRP transmission. The proposed TP seems not necessary. | ZTE | N | Samsung: Support the Moderator’s assessment.  QC: Ok to discuss the issue as the combination of mDCI based mTRP and DAI ordering based on start PDSCH time has not been discussed in RAN1 before.  ZTE: Should be ‘H’.   * According to the current specification, the UE does not count the DAI in the order per the TP, from the perspective of the pseudo-code of type-2 HARQ. Instead, if our understanding is correct, the serving cell should be counted +2 times as given by current specification, where times correspond to the description when UE indicates type2-HARQ-ACK-Codebook and the 2 times correspond to the description when two CORESETpoolindexes are configured, i.e., first time corresponds to TRP-1, and second time corresponds to TRP-2. * So the spec update in the definition of counting as proposed in our TP is essential. |
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| MB.1 | Clarification on triggering offset for aperiodic CMR and IMR for L1-SINR  FL note: seems to be a good issue to be clarified. | Huawei/HiSilicon | H | Apple: We are fine with the clarification.  Samsung: Support the Moderator’s assessment.  QC: Ok to discuss, but 214->5.2.1.5.1 is for all types of AP CSI report including L1-RSRP/SINR, to our understanding. So it is naturally applicable to L1-SINR  ZTE: Non-essential. If our understanding is correct, the related paragraphs in current specification are not dedicated to a specific reporting quantity. Therefore, this existing restriction can apply to L1-SINR reporting directly, besides for CQI. |
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| UL.1 | R1-2203420 proposed editorial correction on Table 7.3.1.1.2-3 as below  Table 7.3.1.1.2-3: Precoding information and number of layers for 4 antenna ports, if transform precoder is enabled and *ul-FullPowerTransmission* is either not configured or configured to *fullpowerMode2* or configured to *fullpower*, or if transform precoder is disabled, *maxRank* = 1, and *ul-FullPowerTransmission* is not configured or configured to *fullpowerMode2* or configured to *fullpower*  FL note: this is correct | CATT | E | Apple: agree with the CR  Samsung: Support the Moderator’s assessment.  QC: OK with this editorial change.  ZTE: Agree with FL’s assessment. |
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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):

In addition, ...

The following **proposals** are made:

* RAN1#109-e email thread assignment for the maintenance on Rel-16 NR\_eMIMO:
  + Email thread 1 (...) addressing ...; moderated by ...

In addition, the following **proposed conclusion** is made:

* ...

# References

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| --- | --- | --- | --- |
| 1 | R1-2203272 | Draft CR on type II HARQ-ACK codebook for Multi-TRP transmission | ZTE |
| 2 | R1-2203420 | Clarification of TPMI indication for UL full power transmssion | CATT |
| 3 | R1-2204161 | Draft CR on type II HARQ-ACK codebook with multiple PDSCHs scheduled by one TRP in a slot | ZTE |
| 4 | R1-2204931 | Discussion on triggering offset of aperiodic CMR and IMR set for L1-SINR | Huawei, HiSilicon |
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