**3GPP TSG RAN WG1 #117 R1-2405488**

**Fukuoka, Japan, May 20th – 24th, 2024**

**Agenda item:** 9.2.2

**Source:** Moderator (Samsung)

**Title:** Moderator Summary of Tuesday afternoon offline on Rel-19 CSI enhancements

**Document for:** Discussion and Decision

## Introduction

The following proposals were discussed.

## Summary of proposals

### Issue 1 (WID objective 2a and 2b): Type-I and Type-II codebook refinement for up to 128 CSI-RS ports

**Proposal 1.D.2**: For the Rel-19 Type-I SP and Type-II codebook refinements (expect based on Rel-18 Type-II Doppler) for 48, 64, and 128 CSI-RS ports, active resource counting is:

* For Capability 1 timeline: {1, K}
* For Capability 2 timeline: {1, K}

**Support/fine:** Ericsson, Nokia/NSB, ZTE (ok), Fraunhofer IIS/HHI, Intel, TCL, Samsung, vivo, Google, CATT, Qualcomm, NTT DOCOMO, Xiaomi, HONOR, Lenovo/MotM, Spreadtrum, CMCC, Sharp, OPPO, MediaTek, Apple

**Not support (K):** Huawei/HiSi (cK ok), Fujitsu,

1:

* Concern: Huawei

K:

* Concern: Qualcomm, Nokia/NSB,

{1, cK} UE reports

* Concern (with cK, ok with K): Qualcomm, Ericsson, ZTE, Samsung

### Issue 2 (WID objective 2c): CRI-based CSI for hybrid beamforming (HBF)

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### Issue 3 (WID objective 3): CJT calibration reporting for non-ideal synchronization and backhaul

**Proposal 3.B.2**: For the Rel-19 aperiodic standalone CJT calibration reporting, when ReportQuantity is ‘cjtc-P’ (DL/UL phase offset), ***support*** >1 (sub-band reporting) as follows:

* A sub-band size is selected from {8,16} PRBs
  + FFS: Whether the sub-band size is NW-configured via higher-layer (RRC) signalling or selected (hence reported) by the UE
* Denoting the number of sub-bands within the configured CSI reporting band as NSB-P, and the sub-bands are indexed as {0, 1, …, NSB-P –1}, decide, by RAN1#117, from the following reporting options:
  + Opt1: {(n,, n), n=0, 1, …, NTRP – 1, n≠nref}, where n,is the phase offset corresponding to sub-band 0 and the phase offset for sub-band  can be calculated as n, + n
    - , where {[32], [64], [128], [256]}
  + Opt2: = NSB-P, i.e. {(n,, n,, n,NSB-P), n=0, 1, …, NTRP – 1, n≠nref}
    - The alphabet for n, follows the previously agreed alphabet for =1, including the ‘invalid’ state
    - FFS: Whether restriction on the maximum payload size is needed
  + Note: For all the above reporting options, the UE performs measurement over the entire configured CSI reporting band

**Support/fine (Opt1+2)**: ZTE, Qualcomm, CATT, Ericsson, Samsung, Fujitsu, NEC, TCL, Sony, KDDI, CMCC, NICT, Sharp, MediaTek, Huawei/HiSi, NTT DOCOMO, Sony

* Strong Concern: vivo, Nokia/NSB, OPPO, Apple,

**Support only Opt1**: NICT, OPPO (2nd), Nokia/NSB (2nd)

* Strong Concern: vivo, Samsung, Lenovo/MotM, CATT

**Support only Opt2**: Lenovo/MotM, Intel (2nd)

* Strong Concern: vivo, Qualcomm, Nokia/NSB, OPPO, ZTE, Ericsson

**Not support >1 (separate D/d+WB PO enough)**: OPPO, Apple, Intel, vivo, Google, Panasonic, Nokia/NSB

**Proposal 3.C.1**: For the Rel-19 aperiodic standalone CJT calibration reporting, when ReportQuantity is ‘cjtc-P’ (DL/UL phase offset), regarding the number of configured associated SRS resource(s) (=Q) for antenna switching xTyR, support Q=1 where:

* the configured associated SRS resource is selected from all the y/x SRS resources and all the configured resource set(s)

Regarding how to determine the SRS port corresponding to the ‘reference UE antenna port’, support PSRS =1 SRS port selected from all the ports from the configured Q associated SRS resource(s)

* FFS (by RAN1#118): Whether PSRS >1 is also supported
* FFS (by RAN1#118): whether Q>1 is also supported
* FFS (by RAN1#118): the supported value(s) of x

**Support/fine:** Samsung, Fujitsu, ZTE, Ericsson, Intel, Qualcomm, Xiaomi, NTT DOCOMO, OPPO, Huawei/HiSi

**Not support: [**Nokia/NSB],

# References