**3GPP TSG- RAN WG1 Meeting #102-e R1-2006497**

**e-Meeting, August 17th – 28th, 2020**

Agenda Item: 7.2.6

Source: Moderator (Apple)

Title: Text proposal on MB.10 issue for Rel.16 NR\_eMIMO MB2

Document for: Discussion/Decision

# Introduction

In this contribution, we provide a text proposal for MB.10 issues.

# Text Proposals on L1-SINR

## CSI-RS for L1-SINR Computation

*Reasons for changes*

In Rel.16, the L1-SINR reporting by measuring CSI-RS as CMR and/or IMR has been supported and captured in specifications. However, the general description of UE behavior on CSI-RS reception for L1-SINR computation was missing in current version of TS.38.214.

*Summary of changes*

Add the general functional description of L1-SINR in the UE procedure of CSI-RS reception.

*Consequence if not approved*

The function description of L1-SINR computation is somehow still missed in specification.

### TP 2.1 for 38.214

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| < Start of the text proposal on TS 38.214 v16.2.0 section 5.6.1.6>  < Unchanged parts are omitted >  5.1.6.1 CSI-RS reception procedure  The CSI-RS defined in Clause 7.4.1.5 of [4, TS 38.211], may be used for time/frequency tracking, CSI computation, L1-RSRP computation, L1-SINR computation and mobility.  < Unchanged parts are omitted >  < End of the text proposal on TS 38.214 v16.2.0 section 5.6.1.6> |

## Ports 3000 and 3001 for L1-SINR

Reason for changes

In 38.215, in the sentence ‘CSI reference signals transmitted on all configured antenna ports can be used for CSI-SINR determination’, it is unclear whether it means all of the antenna ports *configured for the UE* can be used for CSI-SINR determination, or all of the antenna ports *of the CSI-RS resource* are used for CSI-SINR determination. According to the current version of TS 38.213 above, when NZP CSI-RS is used for L1-RSRP or L1-RSRP, the number of antenna ports is 1 or 2. In our view, the definition of CSI-RSRP when used for L1-RSRP in section 5.1.2 is quite clear. For clarity and specification consistency, it can be reused for L1-SINR.

Summary of changes

Clarify only port 3000 and 3001 can be used for L1-SINR.

Consequences if not approved

38.215 and 38.214 may not be consistent

### TP 2.2 for 38.215

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| 5.1.6 CSI signal-to-noise and interference ratio (CSI-SINR)  < Unchanged parts are omitted >  For CSI-SINR determination CSI reference signals transmitted on antenna port 3000 according to TS 38.211 [4] shall be used. If CSI-SINR is used for L1-SINR, CSI reference signals transmitted on ports 3000, 3001 can be used for CSI-SINR determination.  < Unchanged parts are omitted > |

## Resource setting for SP/P L1-SINR

Reason for changes

There was no agreement that NZP-IMR can be used for semi-persistent or periodic reporting for CSI acquisition. Therefore, the following change in RAN1 #100b should only be applicable for L1-SINR. But with current wording, the change is also applicable to CSI measurement.

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| 5.2.1.4.1 Resource Setting configuration  < Texts are omitted >  For semi-persistent or periodic CSI, each *CSI-ReportConfig* is linked to periodic or semi-persistent Resource Setting(s):  - When one Resource Setting (given by higher layer parameter *resourcesForChannelMeasurement*) is configured, the Resource Setting is for channel measurement for L1-RSRP or for channel and interference measurement for L1-SINR computation.  -- When two Resource Settings are configured, the first Resource Setting (given by higher layer parameter *resourcesForChannelMeasurement*) is for channel measurement and the second Resource Setting (given by higher layer parameter *csi-IM-ResourcesForInterference* or higher layer parameter *nzp-CSI-RS-ResourceForInterference*) is used for interference measurement performed on CSI-IM or on NZP CSI-RS.  < Texts are omitted > |

Summary of changes

Clarify that NZP-IMR should be only used for SP/P L1-SINR.

Consequences if not approved

Current spec is incorrect for CSI measurement when NZP-IMR is configured.

### TP 2.3 for 38.214

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| 5.2.1.4.1 Resource Setting configuration  < Unchanged parts are omitted >  For semi-persistent or periodic CSI, each *CSI-ReportConfig* is linked to periodic or semi-persistent Resource Setting(s):  - When one Resource Setting (given by higher layer parameter *resourcesForChannelMeasurement*) is configured, the Resource Setting is for channel measurement for L1-RSRP or for channel and interference measurement for L1-SINR computation.  - When two Resource Settings are configured, the first Resource Setting (given by higher layer parameter *resourcesForChannelMeasurement*) is for channel measurement and the second Resource Setting (given by higher layer parameter *csi-IM-ResourcesForInterference*) is used for interference measurement performed on CSI-IM. For L1-SINR computation, the second Resource Setting (given by higher layer parameter *csi-IM-ResourcesForInterference* or higher layer parameter *nzp-CSI-RS-ResourceForInterference*) is used for interference measurement performed on CSI-IM or on NZP CSI-RS.  < Unchanged parts are omitted > |

## Reporting format for L1-SINR

Reason for changes

In RAN1 #100, CR R1-2002907 to clarify the L1-RSRP report format has been endorsed. It is clarified that the detail format for L1-RSRP reported on PUSCH is the same as that reported on PUCCH. There is similar issue for L1-SINR report.

Summary of changes

To clarify the the reporting format for L1-SINR is the same as that for L1-RSRP when reported by PUSCH.

Consequences if not approved

L1-SINR report format is unclear when reported by PUSCH.

### TP 2.4 for 38.212

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| **6.3.2.1.2 CSI**  <unchanged part omitted>  The mapping order of CSI fields of one report for CRI/RSRP or SSBRI/RSRP reporting is provided in Table 6.3.1.1.2-8. The mapping order of CSI fields of one report for CRI/SINR or SSBRI/SINR reporting is provided in Table 6.3.1.1.2-8A.The procedure in clause 6.3.2 described for CSI part 1 is also applicable for one report for CRI/RSRP, SSBRI/RSRP, CRI/SINR, or SSBRI/SINR reporting.  Table 6.3.2.1.2-3: Mapping order of CSI fields of one CSI report, CSI part 1   |  |  | | --- | --- | | CSI report number | CSI fields | | CSI report #n  CSI part 1 | CRI as in Tables 6.3.1.1.2-3/4/6, if reported | | Rank Indicator as in Tables 6.3.1.1.2-3/4/5 or 6.3.2.1.2-8, if reported | | Wideband CQI for the first TB as in Tables 6.3.1.1.2-3/4/5 or 6.3.2.1.2-8, if reported | | Subband differential CQI for the first TB with increasing order of subband number as in Tables 6.3.1.1.2-3/4/5 or 6.3.2.1.2-8, if reported | | Indicator of the number of non-zero wideband amplitude coefficients for layer 0 as in Table 6.3.1.1.2-5, if reported | | Indicator of the number of non-zero wideband amplitude coefficients for layer 1 as in Table 6.3.1.1.2-5 (if the rank according to the reported RI is equal to one, this field is set to all zeros), if 2-layer PMI reporting is allowed according to the rank restriction in Clauses 5.2.2.2.3 and 5.2.2.2.4 [6, TS 38.214] and if reported | | Indicator of the total number of non-zero coefficients summed across all layers as in Table 6.3.2.1.2-8, if reported | |  | |  | | Note: Subbands for given CSI report *n* indicated by the higher layer parameter *csi-ReportingBand* are numbered continuously in the increasing order with the lowest subband of *csi-ReportingBand* as subband 0. | |   <unchanged part omitted>  Table 6.3.2.1.2-6: Mapping order of CSI reports to UCI bit sequence ,  with two-part CSI report(s)   |  |  | | --- | --- | | UCI bit sequence | CSI report number | |  | CSI part 1 of CSI report #1 as in Table 6.3.2.1.2-3 or Table 6.3.1.1.2-8 or Table 6.3.1.1.2-8A | | CSI part 1 of CSI report #2 as in Table 6.3.2.1.2-3 or Table 6.3.1.1.2-8 or Table 6.3.1.1.2-8A | | … | | CSI part 1 of CSI report #n as in Table 6.3.2.1.2-3 or Table 6.3.1.1.2-8 or Table 6.3.1.1.2-8A |   <unchanged part omitted> |

# Text Proposals on SCell BFR

## Alignment between 38.213 and 38.331 on BFD RS

Reason for changes

Align the RRC parameter for SCell BFR based on latest 38.331. There is no new RRC parameter “beamFailureDetectionResourceList” for SCell BFR, since the corresponding Re-15 RRC parameter framework for PCell is directly reused and the independent parameter can be provided for each BWP of SCell(s).

Summary of changes

Correct RRC parameter name for BFD related parameters.

Consequences if not approved

Misalignment between 38.331 and 38.213.

### TP 3.1 for 38.213

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| **6 Link Reconfiguration**  A UE can be provided, for each BWP of a serving cell, a set  of periodic CSI-RS resource configuration indexes by *failureDetectionResources* and a set  of periodic CSI-RS resource configuration indexes and/or SS/PBCH block indexes by *candidateBeamRSList* or *candidateBeamRSListExt-r16* or *candidateBeamRSSCellList-r16* for radio link quality measurements on the BWP of the serving cell. If the UE is not provided  by *failureDetectionResources* for a BWP of the serving cell, the UE determines the set  to include periodic CSI-RS resource configuration indexes with same values as the RS indexes in the RS sets indicated by *TCI-State* for respective CORESETs that the UE uses for monitoring PDCCH and, if there are two RS indexes in a TCI state, the set  includes RS indexes with QCL-TypeD configuration for the corresponding TCI states. The UE expects the set  to include up to two RS indexes. The UE expects single port RS in the set . The UE expects single-port or two-port CSI-RS with frequency density equal to 1 or 3 REs per RB in the set . |

## Alignment between 38.213 and 38.331 on BFR-SR

Reason for changes

Align the RRC parameter for SCell BFR based on latest 38.331 on BFR-SR.

Summary of changes

Correct RRC parameter name for BFR-SR related parameters.

Consequences if not approved

Misalignment between 38.331 and 38.213.

### TP 3.2-1 for 38.213

TS 38.213 Section 9.2.4

-------- unchanged part omitted ---------------

A UE can be configured by *SchedulingRequestResourceConfig* a set of configurations for SR in a PUCCH transmission using either PUCCH format 0 or PUCCH format 1. A UE can be configured by *schedulingRequestID-BFR-SCell-r16* a configuration for LRR in a PUCCH transmission using either PUCCH format 0 or PUCCH format 1. The UE can be provided, by *phy-PriorityIndex-r16* in *SchedulingRequestResourceConfig*, a priority index 0 or a priority index 1 for the SR. If the UE is not provided a priority index for SR, the priority index is 0.

The UE is configured a PUCCH resource by *SchedulingRequestResourceId*, or by *schedulingRequestID-BFR-SCell-r16*, providing a PUCCH format 0 resource or a PUCCH format 1 resource as described in Clause 9.2.1. The UE is also configured a periodicity  in symbols or slots and an offset  in slots by *periodicityAndOffset* for a PUCCH transmission conveying SR. If  is larger than one slot, the UE determines a SR transmission occasion in a PUCCH to be in a slot with number  [4, TS 38.211] in a frame with number  if .

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### TP 3.2-2 for 38.213

TS 38.213 Section 9.2.5.1 UE procedure for multiplexing HARQ-ACK or CSI and SR in a PUCCH

In the following, a UE is configured to transmit  PUCCHs for respective  SRs in a slot, as determined by a set of *schedulingRequestResourceId* and a *schedulingRequestResourceId* associated with *schedulingRequestID-BFR-SCell-r16*, with SR transmission occasions that would overlap with a transmission of a PUCCH with HARQ-ACK information from the UE in the slot or with a transmission of a PUCCH with CSI report(s) from the UE in the slot.

-------- unchanged part omitted ---------------

If a UE would transmit a PUCCH with  HARQ-ACK information bits in a resource using PUCCH format 2 or PUCCH format 3 or PUCCH format 4 in a slot, as described in Clauses 9.2.1 and 9.2.3,  bits representing a negative or positive SR, in ascending order of the values of *schedulingRequestResourceId* anda *schedulingRequestResourceId* associated with *schedulingRequestID-BFR-SCell-r16*, are appended to the HARQ-ACK information bits and the UE transmits the combined  UCI bits in a PUCCH using a resource with PUCCH format 2 or PUCCH format 3 or PUCCH format 4 that the UE determines as described in Clauses 9.2.1 and 9.2.3. If one of the SRs is a positive LRR, the value of the  bits indicates the positive LRR. An all-zero value for the  bits represents a negative SR value across all  SRs.

If a UE would transmit a PUCCH with  CSI report bits in a resource using PUCCH format 2 or PUCCH format 3 or PUCCH format 4 in a slot,  bits representing corresponding negative or positive SR, in ascending order of the values of *schedulingRequestResourceId* and a *schedulingRequestResourceId* associated with *schedulingRequestID-BFR-SCell-r16*, are prepended to the CSI information bits as described in Clause 9.2.5.2 and the UE transmits a PUCCH with the combined  UCI bits in a resource using the PUCCH format 2 or PUCCH format 3 or PUCCH format 4 for CSI reporting. If one of the SRs is a positive LRR, the value of the  bits indicates the positive LRR. An all-zero value for the  bits represents a negative SR value across all  SRs.