

# QCL for Rel-13 CSI process

Ericsson

Agenda Item: 6.2.4.1

Document for: Discussion and Decision

# Background

- To decode PDSCH, a Rel.11 CSI process in TM10 can be configured with either of two QCL behaviors using the parameter *qcl-Operation*:
  - Type A:
    - The PDSCH DMRS and all NZP CSI-RS are QCL wrt delay spread, Doppler spread and shift, average delay with the serving cell CRS
  - Type B:
    - The PDSCH DMRS and a configurable NZP CSI-RS are QCL wrt delay spread, Doppler spread and shift, average delay using the *CSI-RS-ConfigNZPId-r11* resource indicated in *qcl-CSI-RS-ConfigNZPId-r11*
    - Each NZP CSI-RS resource is QCL wrt Doppler spread and Doppler shift to a configurable CRS resource using *qcl-CRS-Info-r11*
- *In Rel.13 CSI process, a NZP-CSI-RS-ID-List of K resources of *CSI-RS-ConfigNZPId-r11* is introduced in RRC signalling for Rel.13 CSI process*

# Rel.13 CSI process

- *Rel.11 behavior*
  - *Multiple NZP CSI-RS configured for Rel.11 PDSCH*
  - *One NZP CSI-RS per Rel.11 CSI process*
  - *Dynamic selection of ZP CSI-RS and CRS for PDSCH to RE mapping and QCL in DCI format 2D*
- *Rel.13 Proposal:*
  - *A Rel.13 CSI process is an extension of Rel.11 CSI process and inherits all functionality, including QCL type A and type B*
  - *Hence, if  $qcl\text{-Operation} = \text{Type B}$  is configured, then*
    - *Each NZP CSI-RS resource has its own  $qcl\text{-CRS-Info-r11}$  as in Rel.11*
    - *One  $CSI\text{-RS-ConfigNZPId-r11}$  resource is indicated in  $qcl\text{-CSI-RS-ConfigNZPId-r11}$  as in Rel.11*

# Benefits

- *For Class B,  $K > 1$  mode with QCL Type B*
  - *4 Different beams which are not QCL can be supported*
    - *For  $K > 4$ , associating a group of beams with the same CSI-RS-ConfigNZPId-r11 resource is needed*
  - *Basic CoMP + FD-MIMO is supported*
    - *May be revisited in Rel.14 for coordination enhancements and QCL extensions*

# Conclusion

- A Rel.13 CSI process is an extension of Rel.11 CSI process and inherits all functionality, including QCL type A and type B