**3GPP TSG RAN WG1 #106-e R1-210xxxx**

**e-Meeting, August 16th – 27th, 2021**

**Title:** [Draft] LS on Rel-17 inter-cell multi TRP

**Response to:**

**Release:** Rel-17

**Work Item:** NR\_FeMIMO

**Source:** vivo [RAN1]

**To:** RAN2

**CC:**

**Contact Person:**

**Name:** Rakesh Tamrakar

**E-mail Address:** rakesh@vivo.com

**Send any reply LS to: 3GPP Liaisons Coordinator,** **mailto:3GPPLiaison@etsi.org**

**Attachments:** **N/A**

**1. Overall Description:**

For inter-cell multi TRP operation in Rel-17 FeMIMO, RAN1 has reached following agreements in past few meetings:

Agreement from RAN1#103-e

**Agreement**

The information provided by SSB-Configuration-r16/ssb-InfoNcell-r16 and/or MeasObject can be starting point for providing non-serving cell information

Agreements from RAN1#104-e

**Agreement**

Non-serving cell information at least includes non-serving cell PCI to support inter-cell multi-DCI multi-TRP operation

* FFS: Whether the indication of PCI is implicit or explicit

**Conclusion**

Reuse Rel-15/16 QCL rule between the source and target RS/channel for non-serving cell RS/channel.

**Agreement**

At least following non-serving cell SSB information are needed in inter-cell MTRP operation

* SSB time domain position
* SSB transmission periodicity
* SSB transmission power

FFS: Other non-serving cell information

FFS: Whether indication of these information is implicit or explicit

Agreements from RAN1#104b-e

**Agreement**

* For intercell MTRP operation, 1 additional PCI different from the serving cell PCI is supported per CC
	+ The additional PCI is the one associated with one or more TCI states that are activated for [CSI-RS for CSI]/PDSCH/PDCCH, per CC.
	+ Applicable at least for non-cross carrier QCL indication
		- FFS: Cross carrier scheduling QCL indication
* RAN1 to decide on the maximum number of PCIs different from the serving cell PCI per CC and/or across all CCs that can be RRC-configured for multi-DCI based inter-cell multi-TRP
* Above should be specified by reusing R15 QCL rules as concluded in RAN1#104-e

 **Conclusion**

Configuration of CSI-RS for mobility as QCL source for intercell MTRP operation is not supported from Rel-17 specification point of view

Agreements from RAN1#106-e

**Agreement**

Introduce a new RRC indicator/signaling (e.g., re-index the non-serving cell) to indicate the non-serving cell information that a TCI state/QCL information is associated with, where the new indicator/signaling is not the exact PCI value

* Detailed signaling design is up to RAN2

**Agreement**

* Rel. 17 inter-cell MTRP, the maximum number of additional RRC -configured PCIs  per CC is denoted X and can be reported as a UE capability
	+ For the report value of X, multiple candidate values including 1 is supported.
		- FFS : Which values to support other than 1.
		- Values larger than 7 are precluded
		- RAN1 needs to agree on value(s) of X other than 1
* Down-select one of the following alternatives:
	+ Alt 1: A single value of X is reported as UE capability for any possible SSB time domain position and periodicity
	+ Alt 3: At least Two independent X values (X1, X2) are reported as a UE capability for at least two different assumptions on SSB time domain position and periodicity with respect to serving cell SSB
* The serving cell PCI is always associated with active TCI states, only 1 additional PCI can be associated with the active TCI States

**Agreement**

* For inter-cell mTRP, one PCI associated with one or more of activated TCI states for PDSCH/PDCCH is associated with one CORESETPoolIndex , another PCI associated with one or more of activated TCI states for PDSCH/PDCCH is associated with another CORESETPoolIndex
	+ FFS: The association between PCI and CORESETPoolIndex when switching between intra-cell mTRP and inter-cell mTRP

RAN1 is aware of the terminology “non-serving cell” is not proper as mentioned in respective LS in R2-2106787, the terminology “non-serving cell” above means “cell having TRP with different PCI”.

**2. Actions:**

**To RAN2**

**ACTION:**

RAN1 would like to respectfully request RAN2 to take the above agreements into account while designing necessary signaling.

**3. Date of Next TSG-RAN WG1 Meetings:**

TSG-RAN WG1 Meeting #106b-e 11th – 19th Oct. 2021 emeeting

TSG-RAN WG1 Meeting #107-e 11th – 19th Nov. 2021 emeeting