**3GPP TSG-RAN WG4 Meeting #102-e R4-22xxxxx**

**Electronic Meeting, 21st Feb – 3rd Mar, 2022**

**Title:** WF on demodulation requirement for Enhancement on Multi-TRP

**Source:** Huawei, HiSilicon

**Agenda item:** 10.19.4

**Document for:** Approval

# Introduction

This WF capture all agreements and open issues for the following topics in [102-e][330] NR\_FeMIMO\_Demod.

* Topic #1: Demodulation requirement for Multi-TRP enhancement
	+ Sub-topic #1-1 Test Scope
	+ Sub-topic #1-2 Test setup for PDCCH requirement
	+ Sub-topic #1-3 Test setup for PDSCH requirement

The agreed WFs on demodulation requirement for Enhancement on Multi-TRP in previous meeting is listed as following.

* R4-2203092, RAN4#101bis-e

# Topic #1: Demodulation requirement for Multi-TRP enhancement

## Sub-topic #1-1 Test Scope

**Issue 1-1-1: Whether to define PDCCH requirement for multi-TRP repetition transmission schemes**

*Candidate options:*

* Option 1: Yes
* Option 2: No

|  |  |
| --- | --- |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |

**Issue 1-1-2: Whether to define PDSCH requirement to verify whether UE is with proper behaviour of rate matching around the two linked PDCCH.**

*Agreements:*

* No PDSCH requirement defined with rate matching around two linked PDCCH

|  |  |
| --- | --- |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |

**Issue 1-1-3: Whether to define PDSCH requirement for Multi-TRP inter-cell operation**

*Candidate options:*

* Option 1: Yes
	+ Option 1a: Introduce test applicable rule between existing Multi-DCI intra-cell M-TRP test case and new test case for inter-cell Multi-DCI PDSCH
	+ Option 1b: Define performance requirement for enhancements on multi-TRP inter-cell operation with full-overlapping resource allocation.
* Option 2: No
	+ Option 2a: Define applicability for UE that supports “IntCell-Mtrp” feature that if such UE satisfied Rel-16 minimum requirements for PDSCH multi-DCI based transmission scheme, inter-cell operation can be also guaranteed

|  |  |
| --- | --- |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |

## Sub-topic #1-2 Test setup for PDCCH requirement

**Issue 1-2-1: Multi-TRP repetition transmission schemes for PDCCH requirements if introduced**

*Agreements:*

* Only with FDM repetition in FR1

|  |  |
| --- | --- |
|  |  |
|  |  |
|  |  |
|  |  |

**Issue 1-2-2: Simulation Assumption for PDCCH with FDM repetition scheme if introduced**

|  |  |
| --- | --- |
|  |  |
|  |  |
|  |  |  |
|  |  |
|  |  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |

|  |  |
| --- | --- |
|  |  |
|  |  |
|  |  |  |
|  |  |
|  |  |
|  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |
|  |  |
|  |  |

*Agreements:*

|  |  |
| --- | --- |
|  |  |
|  |  |
|  |  |  |
|  |  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |

* Companies are encouraged to provide the simulation results with different AL as {2, 4} with 2x2, and 2x4 antenna configuration in the next meeting with FDM, down selection one of AL under condition of operation SNR>-4dB with 4Rx for PDCCH requirement.

|  |  |
| --- | --- |
| **Parameter** | **Value** |
| **FDD 15 kHz SCS** | **TDD 30 kHz SCS** |
| Repetition transmission schemes | FDM |
| CBW | 10 MHz | 40 MHz |
| CORESET RB | 24 | 48 |
| CORESET duration | 2 |
| Aggregation level | 2/4 |
| Propagation Condition | TDLA30-10 |
| Antenna configuration | 2x2, 2x4 |
| CCE to REG mapping type | nonInterleaved |
| REG bundle size | 6 |
| Payload bits(without CRC) | 39 | 41 |
| Test metric | 1% of Pm-dsg (%) |

|  |  |
| --- | --- |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |

## Sub-topic #1-3 Test setup for PDSCH requirement

**Issue 1-3-1: Simulation Assumption for PDSCH requirment for inter-cell operation if introudced**

*Agreements:*

* Reusing test parameters of existing Rel-16 multi-DCI based on TRP transmission test case (Table 5.2.2.1.12-2) with different PCI for TP1 and TP2 i.e.
	+ Time offset/frequency offset: -0.5us /200Hz for FR1 FDD 15kHz SCS; -0.25us/300Hz for FR1 TDD 30kHz SCS
	+ MCS: 64QAM 1/2
	+ PCI ID: [0] for TP1, [3] for TP2
	+ SSB transmission: SSB 1 for TP1, SSB 2 for TP2

*Candidate options:*

* Option 1:
	+ RB allocation: frequency non-overlapping
	+ Reuse the same requirement of Rel-16 Multi-DCI non-overlapped resource allocation for PDSCH requirement with multi-TRP inter-cell operation
	+ Introduce test applicability rule between Rel-16 Multi-DCI with non-overlapped Tx schemes and Rel-17 Multi-TRP inter-cell Tx schemes
* Option 2:
	+ RB allocation: frequency full-overlapping

|  |  |
| --- | --- |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |

# Reference

1. R4-2207177, Email discussion summary for [102-e][330] NR\_FeMIMO\_Demod, RAN4#102-e, Samsung
2. R4-2203092, WF on demodulation requirement for Enhancement on Multi-TRP, RAN4#101bis-e, Huawei, HiSilicon