3GPP TSG RAN WG1 #101 R1-200xxxx

e-Meeting, May 20th – June 5th, 2020

Source: Moderator (OPPO)

Title: Discussion on Issue#b-10 in Email Thread 3

Agenda Item: 7.2.6.2

Document for: Discussion and Decision

1. Introduction

Rel-16 enhancement on MIMO WID includes objectives of enhancing multi-TRP/Panel transmission with ideal and non-ideal backhaul. During the work of rel-16, designs for multiple-PDCCH based and single-PDCCH based multi-TRP/Panel transmission were discussed and specified. This document provides the discussion for Issue #b-10 in multi-TRP email thread 3:

* Issue #b-10 to correct Description on QCL of DMRS ports of M-TRP PDSCH in 38.211

# Issue#b-10: Description on QCL of DMRS ports of M-TRP PDSCH in 38.211

**Reason for changes**:

In current specification TS 38.211, we have the following description on DMRS in Section 7.4.1.1.2:

|  |
| --- |
| In absence of CSI-RS configuration, and unless otherwise configured, the UE may assume PDSCH DM-RS and SS/PBCH block to be quasi co-located with respect to Doppler shift, Doppler spread, average delay, delay spread, and, when applicable, spatial Rx parameters. The UE may assume that the PDSCH DM-RS within the same CDM group are quasi co-located with respect to Doppler shift, Doppler spread, average delay, delay spread, and spatial Rx. The UE may assume that DMRS ports associated with a PDSCH are QCL with QCL Type A, Type D (when applicable) and average gain. |

That description can only apply to UE when a PDSCH associated with one TCI-state, for instance, single TRP transmission in rel-15. In contrast such restriction in the description does not apply some multi-TRP transmission. Contributions [4] and [12] discussed this issue and proposed TP to correct.

[4] suggests that the QCL assumption of DMRS ports is mainly described in TS 38.214 for both single and multiple TCI states. Thus [4] suggests to remove that sentence in TS 38.211. Furthermore [4] proposes an editorial change that adds the phrase “when applicable”. The TP proposed by [4] is listed as Alt1 below.

[12] suggests also that highlighted description does not apply to single-DCI based multi-TRP transmission when two TCI states are indicated for different DMRS ports in one PDSCH. [4] suggests to add a condition in the description and [4] does not prefer to delete that sentence for backward compatibility to Rel15. The TP proposed by [12] is listed as Alt 2 below.

**Thus, for this issue, we have the following two alternative TPs:**

* **Alt1: TP proposed by [4] for TS 38.211**

|  |
| --- |
| ---------------------------------------Start of text proposal for 7.4.1.1.2 of TS 38.214 --------------------------------------  7.4.1.1.2 Mapping to physical resources  <Unchanged parts are omitted>  In absence of CSI-RS configuration, and unless otherwise configured, the UE may assume PDSCH DM-RS and SS/PBCH block to be quasi co-located with respect to Doppler shift, Doppler spread, average delay, delay spread, and, when applicable, spatial Rx parameters. The UE may assume that the PDSCH DM-RS within the same CDM group are quasi co-located with respect to Doppler shift, Doppler spread, average delay, delay spread, and spatial Rx(when applicable).  The UE may assume that no DM-RS collides with the SS/PBCH block.  ------------------------------------------------------- End of text proposal ------------------------------------------------------ |

* **Alt2: TP proposed by [12] for TS 38.211:**

|  |
| --- |
| 7.4.1.1.2 Mapping to physical resources  <Unchanged parts are omitted>  In absence of CSI-RS configuration, and unless otherwise configured, the UE may assume PDSCH DM-RS and SS/PBCH block to be quasi co-located with respect to Doppler shift, Doppler spread, average delay, delay spread, and, when applicable, spatial Rx parameters. The UE may assume that the PDSCH DM-RS within the same CDM group are quasi co-located with respect to Doppler shift, Doppler spread, average delay, delay spread, and spatial Rx. Except for a PDSCH associated with two TCI states, the UE may assume that DMRS ports associated with a PDSCH are QCL with QCL Type A, Type D (when applicable) and average gain.  The UE may assume that no DM-RS collides with the SS/PBCH block. |

Please input your views and comments on these two alternatives:

|  |  |
| --- | --- |
| Company | Views and comments |
| CATT | Regarding the TP proposed in [12], we have the following comments:   1. Considering the fact that in scheme 3 and 4, DMRS ports associated with a PDSCH are QCL-ed in each transmission occasion, the newly added condition proposed in [12] is still not precise enough. 2. To address the issue of inaccurate description of QCL in 211, two approaches can be considered.    1. Alt-1: elaborate all the QCL cases as accurate as possible in 211    2. Alt-2: for QCL related descriptions in 211, cite corresponding parts in 214   For the above alternatives, alt-2 is preferred. |
|  |  |
|  |  |
|  |  |

1. Reference
2. R1-2003397 On remaining issues on M-TRP vivo
3. R1-2003469 Maintenance of multi-TRP enhancements ZTE
4. R1-2003531 Remaining issues on multi-TRP in R16 Huawei, HiSilicon
5. R1-2003627 Discussion on remaining issues of multi-TRP/panel transmission CATT
6. R1-2003660 Remaining issues on multi-TRP transmission MediaTek Inc.
7. R1-2003742 Corrections to multi-TRP Intel Corporation
8. R1-2003819 Remaining issues on multi-TRP/panel transmission Lenovo, Motorola Mobility
9. R1-2003881 On Rel.16 multi-TRP/panel transmission Samsung
10. R1-2003928 Text proposals on enhancements on multi-TRP/panel transmission LG Electronics
11. R1-2003954 Remaining issues on multi-TRP/panel transmission CMCC
12. R1-2003987 Discussion on remaining issues of multi-TRP operation Spreadtrum Communications
13. R1-2004047 Text proposals for enhancements on multi-TRP and panel Transmission OPPO
14. R1-2004229 Remaining issues for Multi-TRP enhancement Apple
15. R1-2004265 Maintenance of Rel-16 Multi-TRP operation Nokia, Nokia Shanghai Bell
16. R1-2004311 Remaining issues on multi-TRP transmission NEC
17. R1-2004395 Remaining issues on multi-TRP/panel transmission NTT DOCOMO, INC
18. R1-2004432 Remaining issues on Multi-TRP/Panel Transmission Ericsson
19. R1-2004463 Multi-TRP Enhancements Qualcomm Incorporated
20. R1-2004592 Clarification on Multi-TRP URLLC Scheme 4 Convida Wireless
21. R1-2004719 FL summary #2 for Multi-TRP/Panel Transmission Moderator(OPPO)