3GPP TSG RAN WG1 #110bis-e R1-220xxxx

**e-Meeting, October 10th – 19th, 2022**

**Agenda item: 9.17**

**Title: FL summary #1 of remaining issues for two overlapping CRS patterns**

**Source: Moderator (ZTE Corporation)**

**Document for:** **Discussion and Decision**

# Discussion

In [[R1-2208859](file:///D%3A%5CDocs%5CR1-2208859.zip), OPPO], it proposes that the LTE CRS pattern lists in the following 38.211 text should also be extended to include at least *lte-CRS-PatternList3.* It may not be necessary in certain cases to include *lte-CRS-PatternList4,* because the adding of *lte-CRS-PatternList4* needs the adding of *lte-CRS-PatternList3* as a pre-requisite.

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| **7.4.1.1.2 Mapping to physical resources**……For PDSCH mapping type A……- single-symbol DM-RS, $l\_{1}=11$ except if all of the following conditions are fulfilled in which case $l\_{1}=12$:- the higher-layer parameter *lte-CRS-ToMatchAround*, *lte-CRS-PatternList1*, ~~or~~ *lte-CRS-PatternList2,* or *lte-CRS-PatternList3* is configured; and*-* the higher-layer parameter *dmrs-AdditionalPosition* is equal to 'pos1' and $l\_{0}=3$; and*-* the UE has indicated it is capable of *additionalDMRS-DL-Alt* For PDSCH mapping type B……- if the higher-layer parameter *lte-CRS-ToMatchAround*, *lte-CRS-PatternList1*, ~~or~~ *lte-CRS-PatternList2*, or *lte-CRS-PatternList3* is configured, the PDSCH duration $l\_{d}=10$ symbols for normal cyclic prefix, the subcarrier spacing configuration $μ=0$, single-symbol DM-RS is configured, and at least one PDSCH DM-RS symbol in the PDSCH allocation collides with a symbol containing resource elements as indicated by the higher-layer parameter *lte-CRS-ToMatchAround*, *lte-CRS-PatternList1*, ~~or~~ *lte-CRS-PatternList2*, *lte-CRS-PatternList3*, or *lte-CRS-PatternList4,* then $\overbar{l}$ shall be incremented by one in all slots.…… |

## First round

Per FL’s understanding, the issue is valid and the proposed TP seems correct. Therefore, FL proposes to adopt above TP. Companies are encouraged to provide your views below.

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| Company | Views |
| OPPO | Support FL proposal. |
| vivo | Fine with the spirit of the proposed changes, but we slightly prefer to include *lte-CRS-PatternList4* in the changes as well since *lte-CRS-PatternList2* is also included. |
| Xiaomi | Support FL’s proposal with only one minor modification. We also prefer to include *lte-CRS-PatternList4* in all of the above cases, to be consistent with the ‘*lte-CRS-PatternList4*’ in last sentence. |
| NTT DOCOMO | We are fine with the proposal. |
| Qualcomm | Agree with vivo and Xiaomi. |
| Spreadtrum | Agree with vivo and Xiaomi. |
| Ericsson1 | OK with proposal and also to include ‘*lte-CRS-PatternList4*’. Perhaps this can be directly handled during CR phase? |

### Summary

Based on the input, all companies are fine with the intention of the proposed TP. Regarding whether to add lte-CRS-PatternList4 or not, there is no fundamental difference. To align with the legacy style, let’s go with the following updated TP.

**Proposed agreement:**

**The following TP for sub-clause 7.4.1.1.2 of TS 38.211 h30 is endorsed in principle.**

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| **7.4.1.1.2 Mapping to physical resources**……For PDSCH mapping type A……- single-symbol DM-RS, $l\_{1}=11$ except if all of the following conditions are fulfilled in which case $l\_{1}=12$:- the higher-layer parameter *lte-CRS-ToMatchAround*, *lte-CRS-PatternList1*, ~~or~~ *lte-CRS-PatternList2, lte-CRS-PatternList3,* or *lte-CRS-PatternList4* is configured; and*-* the higher-layer parameter *dmrs-AdditionalPosition* is equal to 'pos1' and $l\_{0}=3$; and*-* the UE has indicated it is capable of *additionalDMRS-DL-Alt* For PDSCH mapping type B……- if the higher-layer parameter *lte-CRS-ToMatchAround*, *lte-CRS-PatternList1*, ~~or~~ *lte-CRS-PatternList2*, *lte-CRS-PatternList3* or *lte-CRS-PatternList4* is configured, the PDSCH duration $l\_{d}=10$ symbols for normal cyclic prefix, the subcarrier spacing configuration $μ=0$, single-symbol DM-RS is configured, and at least one PDSCH DM-RS symbol in the PDSCH allocation collides with a symbol containing resource elements as indicated by the higher-layer parameter *lte-CRS-ToMatchAround*, *lte-CRS-PatternList1*, ~~or~~ *lte-CRS-PatternList2*, *lte-CRS-PatternList3*, or *lte-CRS-PatternList4,* then $\overbar{l}$ shall be incremented by one in all slots.…… |

**Please comment only if you have concerns.**

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| Company | Views |
| OPPO | Although we do not think list4 is necessary, we are fine with the TP proposed by FL.  |
| Qualcomm | We are OK with the proposal. |

# Reference

1. [R1-2208859](file:///D%3A%5CDocs%5CR1-2208859.zip), Discussion on remaining issues in Rel-18 eDSS , OPPO.