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

**Electronic Meeting, Feb 21 - Mar 03, 2022**

WF on general part and 15 kHz NR SCS scenario for CRS-IM receiver

China Telecom

# Background

WFs approved in the previous meetings:

[1] R4-2108662, WF on CRS interference handling in scenarios with overlapping spectrum for LTE and NR, RAN4 #99e.

[2] R4-2115740, WF on CRS interference handling in scenarios with overlapping spectrum for LTE and NR, RAN4 #100e.

[3] R4-2120705, WF on CRS-IM receiver in scenarios with overlapping spectrum for LTE and NR, RAN4 #101e.

[4] R4-2203131, WF on general part and 15 kHz NR SCS scenario for CRS-IM receiver, RAN4 #101e-bis.

* Blue font: Majority view and suggested as agreement if no objection
* Yellow highlighted: Issues to be discussed in round 2

Note: the colours will be removed in the final version.

# WF on Test setup for 15 kHz SCS scenario

* Define one set of test setup with the new NWA signalling on LTE CBW configured.
* Define the other set of test setup with only inter-RAT MO configured, if the same test requirements for CRS-IM can be applied, and considering that:
  + Assume no error in LTE CBW detection: 1) based on PBCH decoding and/or power detection for the two interferers with different power level, or 2) based on PBCH decoding and/or power detection for the first dominant interferer.
  + TE does not start PDSCH scheduling of serving cell until UE acquires LTE channel bandwidth, the further discuss the time needed for UE to acquire LTE channel bandwidth:
  + Option A: N x inter-RAT measurement period where N is the number of inter-RAT measurement configuration.
  + Option B: Assume 4 times PBCH combining
  + Other options are not precluded

*Interference power level*

* Only consider INR1 = 10.45 dB and INR2 = 4.6 dB

*PDSCH loading level*

* Only consider 20% PDSCH loading level

*Tx antenna and LTE CRS port number*

* ~~Option 1: Only cover 4 CRS ports (Apple, [E///], HW, QC, Vodafone, MTK)~~
* ~~Option 4 (Recommended WF before round 1 discussion) (Nokia, CMCC, ZTE, Intel, CTC)~~
  + ~~For scenario 1, companies to bring simulation results for both 2 CRS and 4 CRS ports, and further decide whether to define requirements for 2 CRS and/or 4 CRS ports in the next meeting.~~
  + ~~For scenario 2, only cover 4 CRS ports.~~
* Proposed compromise (updated from option 4 by replacing “and/or” with “or”):
  + For scenario 1, companies to bring simulation results for both 2 CRS and 4 CRS ports, and further decide whether to define requirements for 2 CRS or 4 CRS ports in the next meeting.
  + For scenario 2, only cover 4 CRS ports

# UE feature

Note: the UE feature will be added RAN4 feature in thread # [102-e][143] R17\_feature\_list.

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| **Features** | **Index** | **Feature group** | **Components** | **Prerequisite feature groups** | **Need for the gNB to know if the feature is supported** | **Applicable to the capability signalling exchange between UEs (V2X WI only)”.** | **Consequence if the feature is not supported by the UE** | **Type**  **(the ‘type’ definition from UE features should be based on the granularity of 1) Per UE or 2) Per Band or 3) Per BC or 4) Per FS or 5) Per FSPC)** | **Need of FDD/TDD differentiation** | **Need of FR1/FR2 differentiation** | **Capability interpretation for mixture of FDD/TDD and/or FR1/FR2** | **Note** | **Mandatory/Optional** |
| NR\_perf\_enh2\_Demod | X-1 | CRS-IM (Interference Mitigation) in DSS scenario | Support of neighboring cell LTE CRS-IM in DSS scenario with NR 15 kHz SCS  Note: In the DSS scenario, serving and neighboring cells are both operating with dynamic spectrum sharing (DSS) of NR and LTE. | 5-28 (Rate-matching around LTE CRS) | Yes | N/A | NR UE does not support neighboring cell CRS-IM in DSS scenario | Per FSPC | No | Applicable only to FR1 | Support mixture of FDD/TDD | Note: UE can support the feature on the CC(s) in one band only if the UE indicates support of *rateMatchingLTE-CRS* on that band. | Optional with capability signaling |
| NR\_perf\_enh2\_Demod | X-2 | CRS-IM in non-DSS and 15 kHz NR SCS scenario, without the assistance of network signaling on LTE channel bandwidth | Support of neighboring cell LTE CRS-IM in non-DSS and 15 kHz NR SCS scenario, without the assistance of network signaling on LTE channel bandwidth  Note: In the non-DSS scenario, serving cell is operating in NR, and neighboring cells are operating in LTE. |  | Yes | N/A | NR UE does not support neighboring cell CRS-IM in non-DSS and 15 kHz NR SCS scenario, without the assistance of network signaling on LTE channel bandwidth | Per FSPC | No | Applicable only to FR1 | Support mixture of FDD/TDD |  | Optional with capability signaling |
| NR\_perf\_enh2\_Demod | X-3 | CRS-IM in non-DSS and 15 kHz NR SCS scenario, with the assistance of network signaling on LTE channel bandwidth | Support of neighboring cell LTE CRS-IM in non-DSS and 15 kHz NR SCS scenario, with the assistance of network signaling on LTE channel bandwidth |  | Yes | N/A | NR UE does not support neighboring cell CRS-IM in non-DSS and 15 kHz NR SCS scenario, with the assistance of network signaling on LTE channel bandwidth | Per FSPC | No | Applicable only to FR1 | Support mixture of FDD/TDD |  | Optional with capability signaling |
| NR\_perf\_enh2\_Demod | [X-4] | CRS-IM in non-DSS and 30 kHz NR SCS scenario, without the assistance of network signaling on LTE channel bandwidth | Support of neighboring cell LTE CRS-IM in non-DSS and 30 kHz NR SCS scenario, without the assistance of network signaling on LTE channel bandwidth |  | Yes | N/A | NR UE does not support neighboring cell CRS-IM in non-DSS and 30 kHz NR SCS scenario, without the assistance of network signaling on LTE channel bandwidth | Per FSPC | No | Applicable only to FR1 | Support mixture of FDD/TDD |  | Optional with capability signaling |
| NR\_perf\_enh2\_Demod | [X-5] | CRS-IM in non-DSS and 30 kHz NR SCS scenario, with the assistance of network signaling on LTE channel bandwidth | Support of neighboring cell LTE CRS-IM in non-DSS and 30 kHz NR SCS scenario, with the assistance of network signaling on LTE channel bandwidth |  | Yes | N/A | NR UE does not support neighboring cell CRS-IM in non-DSS and 30 kHz NR SCS scenario, with the assistance of network signaling on LTE channel bandwidth | Per FSPC | No | Applicable only to FR1 | Support mixture of FDD/TDD |  | Optional with capability signaling |

# CR work split for 15 kHz SCS scenario

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| Section | Responsibility for draft CR |
| General and applicability sections | Nokia |
| PDSCH requirements - FDD scenario 1 | China Telecom |
| PDSCH requirements - FDD scenario 2 | China Telecom |
| PDSCH requirements - TDD scenario 1 | Huawei |
| PDSCH requirements - TDD scenario 2 | Ericsson |
| Annex A: FRC | CMCC |
| Annex B: Interference modelling  (Note: also cover the inteference model for 30kHz SCS with [10%] loading level) | Intel |

# Collection of simulation results

* Companies are encouraged to provide ideal and impairment simulation results for CRS-IM with 15 kHz SCS in the next meeting.
  + Note: China Telecom will provide a summary of the agreed test parameters as well as a template for simulation result submission after the RAN4 #102-e meeting.