**3GPP TSG-RAN Meeting #89-e RP-200xxx**

**Electronic Meeting, 14 - 18 September, 2020**

**Agenda item:** x.x

**Source:** Moderator (China Telecom)

**Title:** Email discussion summary for RAN4 Rel-17 demodulation scope

**Document for:** Discussion

# Introduction

**Scope:**

According to the work areas of RAN4 R17 non-spectrum related WI/SIs endorsed at RAN #88e [1], this email thread will discuss the RAN4 Rel-17 demodulation scope, based on the initial inputs from [2] - [6].

Meanwhile, the way forward on NR Application Layer Throughput Performance was endorsed at RAN #88e [7], and the detailed objectives and scope on RAN4 study for VRC will also be discussed in this thread.

**Target and time schedule:**

* Companies are invited to provide comments in section 1.2, 2.2, 3.2 4.2, 5.1 and 5.2 (till Sept. 3)
  + - An intermediate summary will be submitted to the August RAN4 meeting.
    - The final summary will be submitted to RAN#89e.
* The corresponding WID and SID update will be submitted to RAN#89e.

# UE advanced receivers

## Companies’ proposals summary

Candidate objectives for UE advanced receivers [2] - [6]:

* Scenario a): Inter-cell interference
  + - Target frequency: FR1 and/or FR2
    - Reference receiver:
* MMSE-IRC with DMRS based interference covariance estimation
* MMSE-IRC with data based interference covariance estimation
  + - Type of requirements: PDSCH and the corresponding CQI reporting requirement
    - Rx antenna number: 2Rx; 4Rx (for FR1 only)
    - Interference profile: LTE interference profiles can be used as a starting point for NR FR1 scenarios
    - Discuss if additional network assistance is required
* Scenario b): Inter-layer interference for SU-MIMO
  + - Target frequency: FR1 and FR2
    - Reference receiver: soft IC
    - Type of requirements: PDSCH and the corresponding CQI reporting requirement
    - Number of data layers: up to 4 for FR1, 2 for FR2
    - Rx antenna number: 2Rx; 4Rx (for FR1 only)
* Scenario c): Intra-cell inter-user interference for MU-MIMO
  + - Target frequency: FR1 and/or FR2
    - Reference receiver: RML, SLIC
    - Type of requirements: PDSCH and the corresponding CQI reporting requirement
    - Rx antenna number: 2Rx; 4Rx (for FR1 only)
    - Discuss if additional network assistance is required

## Companies views’ collection

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| Company | Comments |
| Company A | xxxx |
| Company B | xxxx |
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## Summary

# BS advanced receivers

## Companies’ proposals summary

Candidate objectives for BS advanced receivers [4] - [6]:

* Scenario a): Inter-cell interference
  + - Target frequency: FR1 and/or FR2
    - Reference receiver:
* MMSE-IRC with DMRS based interference covariance estimation
  + - Type of requirements: PUSCH requirement
    - Rx antenna number: 2Rx; 4Rx and 8Rx (for FR1 only)
    - Interference profile: LTE interference profiles can be used as a starting point for NR FR1 scenarios
    - Discuss if additional network assistance is required
* Scenario b): Inter-layer interference for SU-MIMO
  + - Target frequency: FR1 and FR2
    - Reference receiver: soft IC
    - Type of requirements: PUSCH requirement
    - Number of data layers: 2 for FR1 and FR2
    - Rx antenna number: 2Rx; 4Rx and 8Rx (for FR1 only)
* Scenario c): Intra-cell inter-user interference for MU-MIMO
  + - Target frequency: FR1 and/or FR2
    - Reference receiver: Hard-IC (hard L-CWIC), hybrid-IC (mixing hard-IC and soft-IC) as defined in NOMA TR 38.812
    - Type of requirements: PUSCH requirement
    - Rx antenna number: 2Rx; 4Rx and 8Rx (for FR1 only)

## Companies views’ collection

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| Company | Comments |
| Company A | xxxx |
| Company B | xxxx |
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## Summary

# BS FR1 PUSCH 256QAM

## Companies’ proposals summary

Candidate objective [4] [5]:

* Define PUSCH demodulation requirements for FR1 256QAM

## Companies views’ collection

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## Summary

# Link adaptation throughput requirements

## Companies’ proposals summary

Candidate objectives [7] [8]:

* Study the feasibility of defining requirements with link adaptation
  + - Analyze in which scenarios absolute physical layer throughput requirement can be defined
      * Use currently defined RI test setup in 38.101-4 as baseline
      * Use the parameters suggested by RAN5 in R5-195422 as baseline
        + Other scenarios are not precluded if above parameters are not found feasible
* Possible RAN4 work plan
  + - Initial Simulation Assumptions
      * Reuse test parameters used in existing Rank Indication test cases in 38.101-4 as much as possible.
    - Alignment of results
      * Companies to present simulation results, multiple rounds of simulation might be needed
      * Refinement of simulation assumptions if needed
    - Conclusion
      * Tests to be declared feasible for the scenarios in which there is good alignment between results
      * Feasibility to be concluded if results from multiple companies are within +/- X % (e.g. 5%) of average LA throughput

## Companies views’ collection

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## Summary

# Other new proposals

## New proposal on UE demodulation requirements

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## New proposal on BS demodulation requirements

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## Summary

# Conclusions

# References

1. RP-201331, Work areas of RAN4 R17 non-spectrum related WI/SIs, RAN4 Chairman (FUTUREWEI), RAN #88e, 29 June - 3 July 2020.
2. RP‑200615, Motivation paper of new WID on performance requirements for UE advanced receiver in Rel-17, Huawei Technologies Japan K.K, RAN #88e, 29 June - 3 July 2020.
3. RP‑200616, New WID proposal: Performance requirements for UE advanced receiver in Rel-17, Huawei Technologies Japan K.K, RAN #88e, 29 June - 3 July 2020.
4. RP‑200729, Motivation for further enhancement on NR demodulation performance requirements, China Telecom, RAN #88e, 29 June - 3 July 2020.
5. RP‑200730, New WID: Further enhancement on NR demodulation performance, China Telecom, RAN #88e, 29 June - 3 July 2020.
6. RP‑201118, Views on Rel-17 NR Demodulation requirements, Intel Corporation, RAN #88e, 29 June - 3 July 2020.
7. RP-201377, Way forward on NR Application Layer Throughput Performance Work in RAN4, Qualcomm Incorporated, RAN #88e, 29 June - 3 July 2020.
8. RP-201001, Way forward on NR Application Layer Throughput Performance Work in RAN4, Qualcomm Incorporated, RAN #88e, 29 June - 3 July 2020.