**3GPP TSG-RAN WG4 Meeting #101-bis-e R4-2203031**

**Electronic Meeting, 17th Jan 2022 - 25th Jan 2022**

**Agenda item:** 6.18.3

**Source:** Nokia, Nokia Shanghai Bell

**Title:** WF on PUCCH demodulation performance of Rel-17 NR coverage enhancement

**Document for:** Approval

# Background

* This is the first time that the Rel-17 NR coverage enhancement WI is treated in RAN4 demodulation performance. Hence there are no prior WFs.
* Corresponding Email summary in RAN4#101-bis-e
  + R4-2203117 Email discussion summary for [101-bis-e][319] NR\_cov\_enh\_Demod\_NWM.

# WF on topic#2: PUCCH Enhancements of Rel-17 NR Coverage Enhancement

## General

Issue 2-1-1: Test metric for BS PUCCH demodulation test cases

Candidate options:

* Option 1:
  + Test UCI block error probability for PUCCH format 2/3/4
  + Test NACK to ACK detection probability for PUCCH format 1
* Option 2: Reusing the existing test metric for different PUCCH formats can be reused as a baseline
* Option 3: FFS

## Dynamic indication of PUCCH repetition

Issue 2-2-1: Whether to define BS demodulation requirements for dynamic indication of PUCCH repetition

|  |
| --- |
| Agreement:  Agree not to define BS demodulation requirements for dynamic indication of PUCCH repetition. |

## PUCCH demodulation with Joint Channel Estimation (JCE)

Issue 2-3-1: Whether to define BS PUCCH demodulation requirements with JCE

Candidate options:

* Option 1: Yes
* Option 2: No
* Option 3: FFS after the finalization of core requirements in RAN1 and RAN4

Issue 2-3-2: PUCCH format for BS PUCCH demodulation requirements with JCE (if introduced)

Candidate options:

* Option 1: Format 3
* Option 2: Format 1, 2, 3, 4
* Option 3: Format 1
* Option 4: Format 1 and Format 2 or 3 or 4
* Option 5: Format 1 and 3

Issue 2-3-3: Slot number for JCE in BS PUCCH demod requirements (if introduced)

* For TDD
* Option 1: 2 consecutive slots
* Option 2: 4 slots within the configured TDW
* Option 3: Depending on the issue 1-4-2
* For FDD
* Option 1: 2 consecutive slots
* Option 2: more than 2 consecutive slots
* Option 3: 4
* Option 4: 8
* Option 4: Depending on the issue 1-4-2
* Note: Slot number refers to the actual TDW length

Issue 2-3-4: Other parameters for BS PUCCH demodulation requirements with JCE (if introduced)

* Option 1:
* 11 or 22 bits for PUCCH format 3
* 1 PRB allocation and 14 OFDM symbols
* Inter-slot frequency hopping with DMRS bundling
* FR1 and FR2
* Option 2:
* Use legacy configuration as starting point but disable intra-slot frequency hopping to allow for DM-RS bundling.
* Option 3: Consider test configuration of existing multi-slot PUCCH requirements as the starting point