**3GPP TSG-RAN WG4 Meeting # 98-e R4-2103849**

**Electronic Meeting, Jan. 25-Feb. 5, 2021**

Title: WF on IAB-MT EVM measurement in core spec

Source: CATT

Agenda item: 7.4.2.1.2

Document for: Approval

# Background

This WF covers the high level issues of IAB-MT EVM measurement procedure in core spec TS 38.174.

# Way forward

2.1 High level agreements

After the 1st round email discussion and the GTW discussion, the following high level agreements were reached,

**Issue 1-1: Does IAB-MT EVM measurement procedure refer UE spec or follow BS procedure?**

Using BS approach as basis, further discuss on the details required and the modifications not precluded if necessary.

**Issue 1-2: If all of the UL physical channels should be tested for IAB-MT EVM measurement?**

Using BS approach:

1. Core spec: clarify that the EVM (modulation orders) specify for PUSCH.
2. Introduce test models in conformance spec with PUSCH channel.

**Issue 1-3: Should PTRS be used for IAB-MT EVM measurement?**

Follow BS approach to configure PTRS in FR2 with optional.

Further discuss the test model and how to the clarify the optional in conformance specification if needed

**Issue 1-4: How to modify IAB-MT EVM measurement diagram?**

Using BS diagram as basis, further modifications not precluded if necessary.

**Issue 1-6: The basic EVM measurement interval for IAB-MT**

The same as BS approach.

2.2 WF for the details

According to the 1st round discussion agreements, BS approach is used for the IAB-MT EVM measurement as a high level guideline. However, IAB-MT Tx signal is UL signal, some details of BS approach needs to be modified to adapt to UL signal. Every sub-clause of BS EVM is reviewed,

The followings are the preliminary high level estimated modifications for IAB-MT compared with BS EVM measurement procedure.

The CR will be prepared based on the following guidelines, other modifications are not excluded if they’re found technically necessary.

### 2.2.1 FR1 BS approach adaption for IAB-MT

* B.1 Reference point for measurement

Add the measurement reference point for DFT-s-OFDM modulated signals.

* B.2 Basic unit of measurement

No necessary modifications were observed.

* B.3 Modified signal under test

Add the modification equation for DFT-s-OFDM modulated signals.

* B.4 Estimation of frequency offset

No necessary modifications were observed.

* B.5 Estimation of time offset

Window length for UE is smaller than BS. As IAB-MT is part of a network node, it is estimated that the filter implementation capability can be similar with BS and IAB-DU. Therefore the same window length as IAB-DU is proposed for IAB-MT. Based on that technical assumption, the following can be observed.

No necessary modifications were observed including B.5.1 General and B.5.2 Window length.

* B.6 Estimation of TX chain amplitude and frequency response parameters

The UL reference signals are different with DL reference signals, so

Equalizer coefficients calculation method should be modified to adapt to UL signals.

* B.7 Averaged EVM

Change $N\_{dl}$ to $N\_{ul}$, $N\_{ul}^{TDD}$ to $N\_{ul}^{TDD}$.

### 2.2.2 FR2 BS approach adaption for IAB-MT

FR2 modifications are very similar with FR1.

* C.1 Reference point for measurement

Add the measurement reference point for DFT-s-OFDM modulated signals.

* C.2 Basic unit of measurement

No necessary modifications were observed.

* C.3 Modified signal under test

Add the modification equation for DFT-s-OFDM modulated signals.

* C.4 Estimation of frequency offset

No necessary modifications were observed.

* C.5 Estimation of time offset

No necessary modifications were observed including B.5.1 General and B.5.2 Window length.

* C.6 Estimation of TX chain amplitude and frequency response parameters

Equalizer coefficients calculation method should be modified to adapt to UL signals.

* C.7 Averaged EVM

Change $N\_{dl}$ to $N\_{ul}$, $N\_{ul}^{TDD}$ to $N\_{ul}^{TDD}$.

# Reference

[1] R4-2103744 Email discussion summary for [98e][305] NR\_IAB\_RF\_Maintenance

[2] R4-2100365 Discussion on IAB-MT EVM measurement process CATT

[3] R4-2100826 Discussion on EVM measurement methodology for IAB-MT CMCC

[4] R4-2102012 IAB EVM procedure Nokia, Nokia Shanghai Bell

[5] R4-2102333 IAB-EVM procedure Ericsson