3GPP TSG-RAN WG4 Meeting # 96-e DRAFT R4-2012640

Electronic Meeting, 17 – 28 August, 2020

**Source:** Huawei

**Title:** IAB EMC specification: Exclusion bands (4.4)

**Agenda Item:** 7.4.4.1

**Document for:** Approval

# Introduction

In this contribution we provide discussion on the transmitter and receiver Exclusion bands for the purposes of the EMC RI testing of the NR IAB node. The proposed TP to the IAB EMC specification is attached.

# Discussion

The existing NR IAB specification relies on the NR BS specification in many aspects, e.g. both FR1 and FR2 bands are considered for NR IAB operation.

Other than the above consideration, the definition of the IAB node exclusion bands is considered to be based on the NR BS specification TS 38.113, with some refinements addressed below:

* Multi-band operation: Referring to the NR BS specification, those products are clearly capable of multi-band operation. This is also reflected in the definition of the exclusion bands for NR BS. In case of the IAB, there was not consideration of multi-band operation agreed.
* Similar to the NR BS discussion, we do expect the Spatial exclusion concept to be applicable to the IAB node. Due to two radio interfaces of the IAB node, the concept of the Spatial exclusion will require further discussion and refinement next meeting.

NOTE: It shall be clarified that at this point we are not considering any RI testing related issues, which were de-prioritized for this meeting.



Figure 1: Logical IAB functions showing RF interfaces

The following principles were assumed during formulation of the exclusion bands for IAB:

* Exclusion bands apply to IAB irrespective of its operation mode, FDM, SDM, TDM,
* Exclusion bands apply to IAB irrespective of its implementation and its internal hardware, i.e. for both Shared IAB hardware, or Separate IAB hardware cases,
* Exclusion bands apply per NR Uu radio link of the IAB node: In order to define the exclusion bands for the IAB node, we need to consider potential deployments where DU/MT, as well as their TX / RX interfaces are potentially using different frequencies, i.e. the applicability of the exclusion bands shall be per the Uu interface instance, or in other words, per IAB node access or backhaul link of the EUT.
* ΔfOBUE offset: as both FR1 and FR2 spectrum will be used for IAB, it is expected that similar filtering performance as in case of NR BS case be assumed for IAB. Referring to the current version of the TS 38.174 the value of the ΔfOBUE offset is not clearly captured (even though the ΔfOBUE is referred in the IAB-DU receiver spurious requirement table). For the purposes of the TX exclusion band definition, it is proposed to consider the same values of the ΔfOBUE as in case of the NR BS specification, pending to confirmation from the RF discussions.
* ΔfOOB offset: in case of the OTA blocking, the IAB requirements are directly reused from the NR BS specification TS 38.104. The value of the ΔfOOB offset is directly provided in TS 38.174 for *IAB-MT type 2-O* operation with the value of 1500MHz, i.e. the same as for BS type 2-O. Based on those observation, it seems to be reasonable to reuse the ΔfOOB offset for the definition of the receiver exclusions bands from the NR BS EMC specification.

# 3 Conclusions

Based on the above discussion it is proposed to agree on the following:

**Proposal**: agree on the attached TP to the IAB EMC specification, for the definition of the exclusion bands.

# 4 Annex B: TP to IAB EMC TS: Exclusion bands

Based on the discussion initiated in section 2, below we provide a TP to the IAB EMC specification, for the definition of the exclusion bands.

*------------------------------ Modified section ------------------------------*

## 4.4 Exclusion bands

### 4.4.1 Transmitter exclusion band

The*transmitter exclusion band* for IAB is the frequency range over which no tests of radiated immunity of a transmitter are made. As the IAB node may operate its access and backhaul link in different NR IAB *operating band*, the *transmitter exclusion band* for IAB applies separately for the access and backhaul link. The *transmitter exclusion band* applies to IAB type 1-O.

The *transmitter exclusion band* is defined as:

FDL,low – ΔfOBUE <f < FDL,high + ΔfOBUE

Where:

* Values of FDL,low and FDL,high are defined for each NR IAB *operating band* in TS 38.174 [x], clause 5.2.
* The value of ΔfOBUE is derived considering the width of the NR IAB *operating band*, and is defined as in table 4.4.1-1.

Table 4.4.1-1: ΔfOBUE offset values for NR IAB

|  |  |  |
| --- | --- | --- |
| IAB type | NR IAB o*perating band* characteristics | ΔfOBUE (MHz) |
| *IAB type 1-O* | FDL,high – FDL,low < 100 MHz | [10] |
| 100 MHz ≤ FDL,high – FDL,low ≤ 900 MHz | [40] |

NOTE: As the radiated immunity testing is defined in the frequency range 80 MHz to 6 GHz, there is no *transmitter exclusion band* defined for *IAB type 2-O*.

### 4.4.2 Receiver exclusion band

The *receiver exclusion band* for IAB is the frequency range over which no tests of radiated immunity of a receiver are made. As the IAB node may operate its access and backhaul link in different NR IAB *operating band*, the *receiver exclusion band* for IAB applies separately for the access and backhaul link. The *receiver exclusion band* applies to IAB type 1-O.

The *receiver exclusion band* is defined as:

FUL,low – ΔfRX <f < FUL,high + ΔfRX

Where:

* Values of FUL,low and FUL,high are defined for each NR IAB *operating band* in in TS 38.174 [x], clause 5.2.
* The value of ΔfRX is derived considering the width of the NR IAB *operating band*, and is defined as in table 4.4.2-1. [Value of the ΔfRX also depends on the RI test setup, i.e. whether or not the *spatial exclusion zone* (as depicted in figure x) is considered during the RI test].

Table 4.4.1-1: ΔfRX offset values for IAB

|  |  |  |  |
| --- | --- | --- | --- |
| IAB type | IAB o*perating band* characteristics | RI test setup | ΔfRX (MHz) |
|  |  |  |  |
|  |  |
| *IAB type 1-O* | FUL,high – FUL,low < 100 MHz | With exclusion zone | [20] |
| Without exclusion zone | [60] |
| 100 MHz ≤ FUL,high – FUL,low ≤ 900 MHz | With exclusion zone | [60] |
| Without exclusion zone | [200] |

NOTE: As the radiated immunity testing is defined in the frequency range 80 MHz to 6 GHz, there is no *receiver exclusion band* defined for *IAB type 2-O*.

*----------------------------- End of modified section ------------------------------*