**3GPP TSG-RAN WG4 Meeting #** **97-e R4-2017443**

**Electronic Meeting, 2-13 Nov, 2020**

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| *CR-Form-v12.1* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **38.175** | **CR** | **0006** | **rev** | **1** | **Current version:** | **16.0.0** |  |
|  | | | | | | | | |
| *For* [***HE******LP***](http://www.3gpp.org/3G_Specs/CRs.htm#_blank)*on using this form: comprehensive instructions can be found at* [*http://www.3gpp.org/Change-Requests*](http://www.3gpp.org/Change-Requests)*.* | | | | | | | | |
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| ***Proposed change affects:*** | UICC apps |  | ME |  | Radio Access Network | **X** | Core Network |  |

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| ***Title:*** | CR to TS 38.175 on Spatial Exclusion for IAB EMC Radiated Immunity test | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | Ericsson | | | | | | | | | |
| ***Source to TSG:*** | R4 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | NR\_IAB-Core | | | | |  | ***Date:*** | | | 2020-11-02 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | **B** |  | | | | | ***Release:*** | | | Rel-16 |
|  | *Use one of the following categories:* ***F*** *(correction)* ***A*** *(mirror corresponding to a change in an earlier release)* ***B*** *(addition of feature),* ***C*** *(functional modification of feature)* ***D*** *(editorial modification)*  Detailed explanations of the above categories can be found in 3GPP [TR 21.900](http://www.3gpp.org/ftp/Specs/html-info/21900.htm). | | | | | | | | *Use one of the following releases: Rel-8 (Release 8) Rel-9 (Release 9) Rel-10 (Release 10) Rel-11 (Release 11) … Rel-15 (Release 15) Rel-16 (Release 16) Rel-17 (Release 17) Rel-18 (Release 18)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | Introduction of spatial exclusion concept for IAB EMC CR to TS 38.175 on Spatial Exclusion for IAB EMC Radiated Immunity test. Linked to this concept the receiver exclusion bands for IAB nodes are defined. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | Introduction of spatial exclusion concept for IAB EMC CR to TS 38.175 on Spatial Exclusion for IAB EMC Radiated Immunity test.  It is also added the concept of exclusion zone (spatial exclusion) for the definition of receiver exclusion bands. Linked to this change the square brackets in the receiver exclusion bands are removed. | | | | | | | | |
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| ***Consequences if not approved:*** | | Lack of protection alternatives when the IAB node is under radiated immunity testing. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 4.4; 9.2.2 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **Y** | **N** |  | | | |  | | |
| ***Other specs*** | |  | **X** | Other core specifications | | | | TS/TR ... CR ... | | |
| ***affected:*** | |  | **X** | Test specifications | | | | TS/TR ... CR ... | | |
| ***(show related CRs)*** | |  | **X** | O&M Specifications | | | | TS/TR ... CR ... | | |
|  | |  | | | | | | | | |
| ***Other comments:*** | |  | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | |  | | | | | | | | |

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## 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 [2], 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 [2], 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 9.2.2-1) 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*.

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### 9.2.2 Test method and level

The test method shall be in accordance with IEC 61000‑4‑3 [13].The use of reverberation chamber test method according to IEC 61000-4-21 [18], clause 6.1 and Annex D as alternative method is allowed.

- For transmitters, receivers and transceivers the following requirements shall apply:

- The test level shall be 3 V/m amplitude modulated to a depth of 80 % by a sinusoidal audio signal of 1 kHz;

- The stepped frequency increments shall be 1 % of the momentary frequency;

- The test shall be performed over the frequency range 80 MHz - 6000 MHz; with the exception of the exclusion band for receivers (see clause 4.4);

- Responses in stand-alone receivers or receivers which are part of transceivers occurring at discrete frequencies which are narrow band responses, shall be disregarded, see clause 4.3;

- The frequencies selected during the test shall be recorded in the test report.

- [For the test method in accordance with IEC 61000-4-3[13], the following *spatial exclusion zone* can be chosen to protect the IAB node receiver. The EMC RF electromagnetic field immunity requirement applies for the frequency range above 690 MHz (according to the test method in ETSI EN 301 489-50 [28]), in the range of angles except the operational range of angles of the *IAB type 1-O* and *IAB type 2-O* antenna(s) (i.e. except for the half sphere around the EUT radiating direction as depicted on figure 9.2.2-1), ]

Figure 9.2.2-1: EMC RF electromagnetic field immunity requirement testing directions for *IAB type 1-O* and *IAB type 2-O* (horizontal plane depicted) with the *spatial exclusion zone* applied

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