### **IEEE P802.11 Wireless LANs**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| SA Ballot Comment Resolutions on CID 6187 | | | | |
| Date: 2024-07-10 | | | | |
| Author(s): | | | | |
| Name | Affiliation | Address | Phone | Email |
| Steve Shellhammer | Qualcomm |  |  | shellhammer@ieee.org |
| Bin Tian | Qualcomm |  |  | btian@qti.qualcomm.com |

**Abstract**

The document provides comment resolutions for CIDs: 6187.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **CID** | **Clause** | **Page/Line** | **Comment** | **Proposed Change** | **Resolution** |
| 6187 | 9.4.1.78.3 | 54/31 | Frequency channel response down-sampling (Ng) may lead to the aliasing in time domain. Ng=16 correspond to max 0.8us delay spread period, i.e, a delay tap with 0.8us will alias with a delay tap of 0us. | Suggest adding a note in the spec to remind implementor that anti-aliasing pre-processing on the frequency domain estimated channel may be needed before down-sampling (Ng) operation | **Revised**  TGbf Editor make the edits shown in 802.11-24/1164r0 |

**Discussion**

IEEE 802.11bf standard supports different tone decimation modes for channel capture feedback. Ng=4 and 8 are mandatory and Ng=16 is optional. Larger Ng implies less overhead for channel capture transmission, but puts a limit on maximum delay spread we can correctly measure before it starts to cause aliasing. The following table illustrates this possible aliasing.

|  |  |  |
| --- | --- | --- |
| Tone decimation (Ng) | Subcarrier spacing after tone decimation (kHz) | Maximum delay spread measurable without aliasing () |
| 4 | 312.5 | 3.2 |
| 8 | 625 | 1.6 |
| 16 | 1250 | 0.8 |

Aliasing can cause an error in estimating direct path and each reflection path, as a result negatively affecting the sensing applications that rely on separating different paths for sensing such as per-path time of arrival (TOA) estimation and per-path angle of arrival (AoA). Here is an example.

A graph with blue dots

Description automatically generated A graph with blue lines

Description automatically generated

Hence, we recommend adding a Note to the draft on this topic.

**Instructions to the Editor**

TGbf Editor Please add the following text in Red to Draft 4.0

|  |  |  |  |
| --- | --- | --- | --- |
| * Sensing Measurement Report Control field definition | | | |
| Field | Size (bits) | Definition | Meaning |
| … | … | … | … |
|  | 1 | Indicates the subcarrier grouping setting | Set to 0 to indicate a subcarrier grouping of  except when there are five or more transmit chains and the bandwidth is greater than or equal to 160 MHz.  Set to 0 to indicate a subcarrier grouping of  when there are five or more transmit chains and the bandwidth is greater than or equal to 160 MHz.  Set to 1 to indicate a subcarrier grouping of .  NOTE:  is optionally supported.  NOTE: NOTE: For the case of Ng = 16, in order to avoid time domain delay tap aliasing, anti-aliasing pre-processing on estimated frequency channel response may be needed before the down-sampling (Ng) operation. |
| … | … | … | … |