IEEE P802.11  
Wireless LANs

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| Proposed Resolution for CID 7021 | | | | |
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Abstract

This document provides the context for the proposed resolution for CID 7021

CID 7021 - 4388.54

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| All "Tx antennas" in this paragraph should be "Tx antenna chains" | As in comment | Revised:  Replace “Tx antennas” with “transmitted space-time steams” in 5 locations in the paragraph.  Also, correct the requirement to ensure that each transmitted space-time stream is transmitted at a constant power level for each HE Ranging NDP PPDU. |

**4388.54:**

**“**In each HE-LTF User Block within the HE-LTF field, the number of Tx antennas are the same as the number indicated in NUM\_STS for the corresponding HE-LTF User Block and may vary from one HE-LTF User Block to another. Within the HE-STF Field, the number of Tx antennas should match the first HE-LTF User Block. In the pre-HE modulated fields, the number of Tx antennas used shall be no less than the minimum number of Tx antennas used in the HE modulated fields. The sum of the Tx power across all Tx antennas shall remain constant throughout the entire HE Ranging NDP PPDU.**“**

The intent of this paragraph is to ensure that each HE-LTF User Block is transmitted on a fixed set of space-time streams and that the power used to transmit it is constant on each of the space-time streams. Each space-time steam is defined by a single TX chain and a single TX antenna. Note, the single TX antenna is whatever is connected to the antenna port of the transmit chain, it could be single physical antenna or a set of physical antennas. Note for any single HE Ranging NDP the number of spatial streams is fixed (set by the HE-STF field) and the power on each spatial stream (each transmit chain) is constant for the entire NDP.

The use of the term “Tx antenna” to describe each of the spatial streams: Tx chains, and associated antennas is confusing, especially when looking at Figure 27-14 (see below). The statement that the number of Tx antennas are the same as the number of indicated in NUM\_STS is also confusing as NUM\_STS is the number of space-time streams.

Lastly, technical changes are made to the last sentence that I believe are necessary to maintain a constant power for each space-time stream for the entire HE Ranging NDP PPDU. If the total power is maintained, in stead of the space-time stream power, then there may a power change in the space-time stream of a HE-LTF User Block relative to that transmitted in the HE-LTF, pre-HE modulated fields, and other HE-LTF User Blocks as the number of space-time streams in the block vary. e.g., if HE-LTF User Block 1 uses 2 STS and HE-LTF User Block 2 uses 1 STS, the power transmitted on the single space-time stream during HE-LTF User Block 2 would be 3 dB higher than that of HE-LTF User Block 1, HT-LTF, and per-HE modulated fields on that space-time steam, as the second space-time stream would not be transmitted.

Proposed text:

**“**In each HE-LTF User Block within the HE-LTF field, the number of transmitted space-time streams are indicated in NUM\_STS for the corresponding HE-LTF User Block and may vary from one HE-LTF User Block to another. Within the HE-STF Field, the number of transmitted space-time streams should match the first HE-LTF User Block. In the pre-HE modulated fields, the number of transmitted space-time streams used shall be no less than the minimum number of transmitted space-time streams used in the HE modulated fields. The Tx power for each transmitted space-time stream shall remain constant throughout the entire HE Ranging NDP PPDU.**“**

For reference (4264.17):

A diagram of a system

Description automatically generated

Also note the following **editorial correction**:

1. Figure 27-50 (4387.60) the HE-LTF Field arrow has been shifted to the left, this arrow should begin at the same location as the 1st HE-LTF User Block and 1st HE-LTF Repetition Block arrows. Also, the HE-LTF Repetition Block for HE-LTF U2-A1 and HE-LTF U2-A2 is not drawn correctly as both blocks should be in a single HE-LTF Repetition Block (not two different repetition blocks), and this single repetition block is the HE-LTF User Block.
2. “TX antenna” and “Tx antenna” are both present in the draft – There are 40 instances of “Tx antenna” (5 of which will be eliminated if the above change is acceptable) and 60 instances of “TX antenna”. Propose changing to TX every where.   
   Also note there are 1743 instances of TX, and 614 of Tx and there are 1183 instances of RX and 511 of Rx. Suggest these should all be cleaned up, but it is a big job as many of them are in figures.

**References:**