IEEE P802.11  
Wireless LANs

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| **Comment resolution on Clauses 26.3.9 and 26.3.10** |
| **Date:** 2016-11-04 |

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Abstract

This submission proposes resolutions for multiple comments on Clauses 26.3.9 and 26.3.10 of the IEEE 802.11ax D0.1 with the following 15 CIDs:

* 2043, 2044, 2047, 2048, 2049, 2050, 2051, 2052, 2053, 2054, 2055, 2056, 2058, 2059, 2062 (15 comments),

These comments are for Clause 26 but were erroneously submitted for clause 6.

Revision history

R6: revise resolution to CID 2058 reflecting discussion on AM2, 08 Nov.

R5: revise resolution to CID 2058 reflecting discussion on PM2, 07 Nov.

R1-R4: revise minor typos and errors.

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| **CID** | **PP.LL** | **Clause** | **Comment** | **Proposed Change** | **Resolution** |
| 2048 | 121.45 | 6.3.9.9 | "r" is undefined in (26-36) | Define "r" as RU index | Revised.  Agreed in principle.  This comment is for Clause 26.3.9.9, not 6.3.9.9. Not only r but also u should be defined. See the resolution presenteded in 16/1377 (this document). |

**Discussion**

The equation (26-36) on P245L11 in D0.5 does not have the explicit definitions of the RU index *r* and the user index *u*. These indices should be defined within the paragraph.

**Proposed Text**

**TGax Editor: *Add the following text at the last paragraph of the Clause 26.3.10.9 in D0.5:* (#2048)**

* **HE-STF**

The time domain representation of the signal for HE trigger-based PPDUs transmitted by user-*u* in the *r*-th RU(#2048) on frequency segment *iSeg* of transmit chain *iTX* shall be as specified in Equation (26-36).

* (#316)

where

 is the windowing function for HE-STF field in the HE trigger-based PPDU

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| **CID** | **PP.LL** | **Clause** | **Comment** | **Proposed Change** | **Resolution** |
| 2055 | 132.55 | 6.3.10.1 | unclear sentence | Meaning of "(bits for SU and bits for each user u in MU)" is not clear. Propose to delete. | Accpted.  This comment is for Clause 26.3.10.1, not 6.3.10.1. |

**Discussion**

The sentence is ulclear and redundant. It should be removed.

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| **CID** | **PP.LL** | **Clause** | **Comment** | **Proposed Change** | **Resolution** |
| 2058 | 133.52 | 6.3.10.2 | Clarify terminology | "1st half", "2nd half" should be clarified. Better to use "first N\_CBPS,LAST bits", "last N\_CBPS,LAST bits" | Revised.  This comment is for Clause 26.3.10.2, not 6.3.10.2. See the resolution presenteded in 16/1377 (this document). |

**Discussions**

In the case of STBC transmission, the coded bits are mapped into 2x2 space-time domain. Both of two spatial streams carry all of remaining coded bits; therefore, the Figure 26-28 is incorrect. The padding process is the same manner as non STBC case except the number of OFDM symbols that carry FEC output and post-FEC padding bits.

**Proposed Text**

***Change the text of the Clause 26.3.11.2 in D0.5: (#2058)***

* **Pre-FEC encoding process**

A two-step padding process is applied on all HE PPDUs. A pre-FEC padding with both MAC and PHY padding is applied before conducting FEC coding, and a post-FEC PHY padding is applied on the FEC encoded bits.

The pre-FEC padding may pad toward 4 possible boundaries in the last one (in the case of non STBC), or two (in the case of STBC) OFDM symbols of an(#2829) HE PPDU, the 4 possible boundaries partition(#1837) the FEC output bit stream of the last OFDM symbol(s) into 4 symbol segments. The 4 possible boundaries are represented by a pre-FEC padding factor parameter(#326)(#2564).

Figure 26-27 (HE PPDU padding process in the last OFDM symbol (non STBC) when a = 1) illustrates these 4 possible symbol segments in the last OFDM symbol of a non STBC case, and the general padding process assuming the desired pre-FEC padding boundary, pre-FEC padding factor, is 1. In the case of STBC, the FEC output bits and post-FEC padding bits are modulated into the last two OFDM symbols by STBC encoding, each with the same number of effective symbol segments. (#2058)

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| * **HE PPDU padding process in the last OFDM symbol (non STBC) when *a* = 1** |

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| **CID** | **PP.LL** | **Clause** | **Comment** | **Proposed Change** | **Resolution** |
| 2062 | 135.55 | 6.3.10.2 | The MAC pre-FEC padding appears to be the same as the PSDU padding | Clarify relation between (26-67) and A-MPDU padding performed by the MAC, especially the content of the padding bytes (empty subframes, ...) | Revised.  This comment is for Clause 26.3.10.2, not 6.3.10.2. See the resolution presenteded in 16/1377 (this document). |

**Discussion**

In a case of a HE SU PPDU with LDPC encoding, pre-fec padding is done at both of MAC and PHY layers. That is different from BCC encoding cases. Clarifications should be added for better understanding.

**Proposed Text**

**TGax Editor: *Add the following text at the second paragraph of the Clause 26.3.11.1 in D0.5: (#2055)***

* Data field
* Pre-FEC encoding process

For an(#2829) HE SU PPDU with LDPC encoding, the number of pre-FEC pad bits is calculated using Equation (26-64).

 (26-64)

Among the pre-FEC padding bits, the MAC delivers a PSDU that fills the available octets in the Data field of the HE PPDU, toward the desired pre-FEC padding boundary, represented by a\_init value, in the the last OFDM symbol(s). The number of pre-FEC pad bits added by MAC will always be a multiple of eight.(#2062) The PHY then determines the number of the remaining(#2062) pad bits to add and appends them to the PSDU. The number of pre-FEC pad bits added by PHY will always be 0 to 7. The procedure is defined in Equation (26-65).

 (26-65)

**Following comments are resolved by the other submissions or rejected.**

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| **CID** | **PP.LL** | **Clause** | **Comment** | **Proposed Change** | **Resolution** |
| 2043 | 120.10 | 6.3.9.9 | unclear sentence. | Meaning of "multiplying integer coefficient(s) to each 20 MHz subchannel" is not clear | Revised.  Agreed in principle.  This comment is for Clause 26.3.9.9, not 6.3.9.9. Resolution already presented in 16/0659r1 (for CID 313). |
| 2044 | 120.63 | 6.3.9.9 | Wrong references | (25-3) and (25-8) don't exist | Revised.  Agreed in principle.  This comment is for Clause 26.3.9.9, not 6.3.9.9. Resolution already presented in 16/0535r8 (for CID 530) revised by the editor. |
| 2047 | 121.36 | 6.3.9.9 | wrong reference: 25.3.10.10.x | fix reference | Revised.  Agreed in principle.  This comment is for Clause 26.3.9.9, not 6.3.9.9. Resolution already presented in 16/0535r8 (for CID 1094). |
| 2049 | 128.01 | 6.3.9.10 | Where are R-LTF and L-LTF defined? | Clarify | Revised.  Agreed in principle.  This comment is for Clause 26.3.9.10, not 6.3.9.10. Resolution already presented in 16/1202r5 (for CID 1865). |
| 2050 | 129.01 | 6.3.9.10 | Notation "L-LTF" is confusing | L-LTF is widely understood as non-HT Long Training Field. Use different notation. | Revised.  Agreed in principle.  This comment is for Clause 26.3.9.10, not 6.3.9.10. Resolution already presented in 16/1202r5 (for CID 1865). |
| 2051 | 129.11 | 6.3.9.10 | Notation in (26-49) and (26-50) is not clear | Clarify notations used in these equations | Revised.  Agreed in principle.  This comment is for Clause 26.3.9.10, not 6.3.9.10. Resolution already presented in 16/1202r5 (for CID 1865). |
| 2052 | 132.02 | 6.3.9.10 | There is a scaling mismatch between HE-LTF and Data is n\_HE-LTF = sqrt(2) | Scaling should be the same for data and HE-LTF | Revised.  Agreed in principle.  This comment is for Clause 26.3.9.10, not in 6.3.9.10. Resolution already presented in 16/0872r1 (for CID 526). |
| 2053 | 132.46 | 6.3.10.1 | Wrong reference | (25-x) should be (26-17) | Revised.  Agreed in principle.  This comment is for Clause 26.3.10.1, not 6.3.10.1. Resolution already presented in 16/0535r8 (for CID 1625). |
| 2054 | 132.51 | 6.3.10.1 | Redundant sentence | "The Data field in UL MU transmissions shall immediately follow the HE-LTF section" should be clear from the definition of the HE PPDU format. In fact, it applies to all formats, not just UL MU. | Revised.  Agreed in principle.  This comment is for Clause 26.3.10.1, not 6.3.10.1. Resolution already presented in 16/1259r2 (for CID 2561). |
| 2056 | 133.01 | 6.3.10.2 | There is no definiton of the scrambler | Scrambler is shown in e.g. Figure 26-32, but never defined. | Revised.  Agreed in principle.  This comment is for Clause 26.3.10.2, not 6.3.10.2. Resolution already presented in 16/0942r3 (for CID 2442). |
| 2059 | 134.17 | 6.3.10.2 | APEP\_LENGTH is not defined | Define APEP\_LENGTH in TXVECTOR or use other appropriate parameter from TXVECTOR | Rejected.  This comment is for Clause 26.3.10.2, not 6.3.10.2. There is already a sentence “APEP\_LENGTH is the TXVECTOR parameter APEP\_LENGTH.” in P134L17 of D0.1 (in P198L42 of D0.5). |