IEEE P802.11  
Wireless LANs

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| Comment Resolutions for Clause 36.3.12.3 coding | | | | |
| Date: 2021-02-11 | | | | |
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Abstract: This document contains proposed resolutions for comments in *Clause 36.3.12.3* from 11be D0.3 with 6 CIDs below, and in *Clause 36.3.12.7* from 11be D0.3 with 2CIDs below

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| ***Clause 36.3.12.3***   * 1142, 2642, 2648, 2649, 2903, 2950   ***Clause 36.3.12.7***   * 3115, 3116 | | | | |  | |
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| 1142 | 10.6.11 | | 273.29 | Add 4K QAM to the table(references relative to TGax 8.0) | As in comment. | **Revised.**  Agree with commentor to add 4K QAM to Table 10-10 Non-HT reference rate. (Pages are referred to 11ax D8.0).  TGbe editor: Incorporate the changes in [https://mentor.ieee.org/802.11/dcn/21/11-21-0324-01-00be-comment-resolutions-for-clause-36-3-12-3-coding.docx](https://mentor.ieee.org/802.11/dcn/21/11-21-0324-00-00be-comment-resolutions-for-clause-36-3-12-3-coding.docx). | | | |

be editor: please add new *Clause 10.6.11 in D0.3*

* On P84L56 (CID #1142):

**10.6.11 Non-HT basic rate calculation**

***Change as follows:***

This subclause defines how to convert an HT-MCS, a VHT-MCS, an HE-MCS, or an EHT-MCS to a non-HT basic rate for the purpose of determining the rate of the response frame. It consists of two steps as follows:

a) Use the modulation and coding rate determined from the HT-MCS (defined in 19.5 (Parameters for

HT-MCSs)) or VHT-MCS (defined in 21.5 (Parameters for VHT-MCSs)) or HE-MCS (defined in

27.5 (Parameters for HE-MCSs)) or EHT-MCS (defined in 36.5 (Parameters for EHT-MCSs)) to locate a non-HT reference rate by lookup into Table 10-10 (Non-HT reference rate).1 In the case of an MCS with UEQM, the modulation of stream 1 is used.

b) The non-HT basic rate is the highest rate in the BSSBasicRateSet that is less than or equal to this

non-HT reference rate.

NOTE 1—The selection of a non-HT basic rate for the frame sent in response to an HE or EHT PPDU is not influenced by DCM encoding in the HE or EHT PPDU.

NOTE 2—In a TVWS band, the non-HT reference rate is scaled as described in 22.2.4 (Support for Non\_HT and HT formats).

***Change Table 10-10 (Non-HT reference rate) as follows:***

**Table 10-10 ⎯Non-HT reference rate**

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| **Modulation** | **Coding rate (R)** | **Non-HT reference rate (Mb/s)** |
| BPSK | 1/2 | 6 |
| BPSK | 3/4 | 9 |
| QPSK | 1/2 | 12 |
| QPSK | 3/4 | 18 |
| 16-QAM | 1/2 | 24 |
| 16-QAM | 3/4 | 36 |
| 64-QAM | 1/2 | 48 |
| 64-QAM | 2/3 | 48 |
| 64-QAM | 3/4 | 54 |
| 64-QAM | 5/6 | 54 |
| 256-QAM | 3/4 | 54 |
| 256-QAM | 5/6 | 54 |
| 1024-QAM | 3/4 | 54 |
| 1024-QAM | 5/6 | 54 |
| 4096-QAM | 3/4 | 54 |
| 4096-QAM | 5/6 | 54 |

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1 For example, if an HT PPDU transmission uses 64-QAM and coding rate of 3/4, the related non-HT reference rate is 54 Mb/s.

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| 2642 | 36.3.12.3.1 | 288.26 | Misc fixes to introduction section for Coding | 1) Edit as follows:  For an EHT MU PPDU, the coding type is selected by the Coding subfield in the User field of EHT-SIG, as defined in 36.3.11.8 (EHT-SIG), if the RU/MRU size for that user is smaller than or equal to 242 tones.  2) Similar to 27.3.12.5 in P802.11ax D8.0, include information on number of BCC encoders. | **Revised.**  Agreed with commentor that LDPC is mandatory for RU/MRU size greater than 242 tones.  TGbe editor: Incorporate the changes in [https://mentor.ieee.org/802.11/dcn/21/11-21-0324-01-00be-comment-resolutions-for-clause-36-3-12-3-coding.docx](https://mentor.ieee.org/802.11/dcn/21/11-21-0324-00-00be-comment-resolutions-for-clause-36-3-12-3-coding.docx). |

be editor: please make the changes in D0.3 *Clause 36.3.12.3.1*

* On P288L26 (CID #2642):

For an EHT MU PPDU, the coding type is selected by the Coding subfield in the User field of EHT-SIG, as defined in 36.3.11.8 (EHT-SIG). For an EHT TB PPDU, the coding type is selected by the UL FEC Coding Type subfield in User Info field in the soliciting Trigger frame, or the RU size indicated in RU Allocation subfield in the soliciting frame carrying a TRS Control subfield, as defined in 9.3.1.22 (Trigger frame format) and 35.4.1.1 (TXVECTOR parameters for EHT TB PPDU response to TRS Control subfield), respectively (TBD). The coding type can be either BCC or LDPC if the size of the RU or MRU assigned to the STA is less than or equal to 242 tones, otherwise it shall be LDPC.

When conducting BCC FEC encoding for an EHT PPDU, the number of encoders is always 1 per STA.

When conducting FEC encoding for multi-link operation, one FEC encoder is applied to one PSDU per STA for each link.

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| 2648 | 36.3.12.3.3 | 288.57 | Clarify that LDPC is the only supported coding type for EHT MCS 14 (DUP mode), and mandatory support based on EHT MCS capability | Edit as follows:  LDPC is the only FEC coding scheme in the EHT PPDU Data field for EHT-MCSs 10 to 13 14  Support for LDPC coding (for both transmit and receive) is mandatory for EHT STAs declaring support for at least one of EHT 40/80/160/320 MHz PPDU bandwidths for SU transmission, for EHT STAs declaring support for more than four spatial streams, or for EHT STAs declaring support for EHT-MCSs 10 and 11 up to 10, 11, 12 or 13, or for EHT-MCS 14 .. | **Revised.**  Agreed with commentor that LDPC is mandatory for MCS 14 since RU size is greater than 242 tones.  TGbe editor: Incorporate the changes in [https://mentor.ieee.org/802.11/dcn/21/11-21-0324-01-00be-comment-resolutions-for-clause-36-3-12-3-coding.docx](https://mentor.ieee.org/802.11/dcn/21/11-21-0324-00-00be-comment-resolutions-for-clause-36-3-12-3-coding.docx). |

be editor: please make the following changes in D0.3 *Clause 36.3.12.3.3*:

* On P288L33 (CID #2648):

LDPC is the only FEC coding scheme in the EHT PPDU Data field for EHT-MCSs 10 to14. The LDPC Coding In Payload subfield of the EHT Capabilities element indicates support for the transmission and reception of the LDPC encoded PPDUs. Support for LDPC coding (for both transmit and receive) is mandatory for EHT STAs declaring support for at least one of EHT 40/80/160/320 MHz PPDU bandwidths for SU transmission, for EHT STAs declaring support for more than four spatial streams, for EHT STAs declaring support for EHT-MCSs 10 and 11, or for EHT STAs declaring support for EHT-MCS 14, according to the LDPC Coding In Payload subfield of the EHT Capabilities element as defined in 9.4.2.295c (EHT Capabilities element).

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| 2649 | 36.3.12.3.5 | 291.10 | N\_SD,short should be undefined for MRUs 2x996+484 and 3x996+484 with MCS15 | Set entries corresponding to rows "2x996+484-tone" and "3x996+484-tone" under column "MCS = 15" to "-", and add a NOTE below the table that MCS15 is undefined for these RU types | **Revised.**  Agreed with commentor that MRUs 2x996+484 and 3x996+484 do not apply to MCS15.  TGbe editor: Incorporate the changes in [https://mentor.ieee.org/802.11/dcn/21/11-21-0324-01-00be-comment-resolutions-for-clause-36-3-12-3-coding.docx](https://mentor.ieee.org/802.11/dcn/21/11-21-0324-00-00be-comment-resolutions-for-clause-36-3-12-3-coding.docx). |
| 2903 | 36.3.12.3.5 | 291.10 | MRU 996x2 +484 and MRU 996x3+484 does NOT support MCS15.  However, Nsd,short values are shown in table for these two configure for mcs15. | In table 36-35, remove Nsd, short value for MCS15 with MRU size 996x2 +484 and 996x3 +484 | **Revised.**  It is resolved by the resolution of CID2649 as in doc: [https://mentor.ieee.org/802.11/dcn/21/11-21-0324-01-00be-comment-resolutions-for-clause-36-3-12-3-coding.docx](https://mentor.ieee.org/802.11/dcn/21/11-21-0324-00-00be-comment-resolutions-for-clause-36-3-12-3-coding.docx). |

be editor: please make the following changes in D0.3 *Clause 36.3.12.3.5*:

* On P291L10 (CID #2649):

**Table 36-35 values** for EHT- MCS values from 0 to 13 and 15 (continued)

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| **RU/MRU size** |  | |
| **MCS** | **MCS = 15** |
| 2x996-tone | 492 | 246 |
| 2x996+484-tone | 612 | N/A |
| 3x996-tone | 732 | 366 |
| 3x996+484-tone | 852 | N/A |
| 4x996-tone | 984 | 492 |
| Note: MCS15 is not supported for transmit and receive over MRU 2x996+484 and MRU 3x996+484 (See 36.1.1 Introduction to the EHT PHY). | | |

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| 2950 | 36.3.12.3.5 | 291.40 | The equation has some typo. "^" should be "}" | Correct the equation. | **Revised.**  ⋀ is not a typo, it is a logical symbol used in mathematics denoting “logical and”. To make the equation easier to understand, it is revised.  TGbe editor: Incorporate the changes in [https://mentor.ieee.org/802.11/dcn/21/11-21-0324-01-00be-comment-resolutions-for-clause-36-3-12-3-coding.docx](https://mentor.ieee.org/802.11/dcn/21/11-21-0324-00-00be-comment-resolutions-for-clause-36-3-12-3-coding.docx). |

be editor: please make the following changes in D0.3 *Clause 36.3.12.3.5*:

* On P291L40 (CID #2649):

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| 3115 | 36.3.12.7 | 298.36 | LDPC tone mapper subclause should be placed after Constellation mapping since it is done on the modulated QAM symbol. The current order in spec is not aligned with transmit block diagram. | As in comment | **Revised.**  Agreed with commentor that Constellation mapping process should be done before LDPC tone mapper.  TGbe editor: Incorporate the changes in [https://mentor.ieee.org/802.11/dcn/21/11-21-0324-01-00be-comment-resolutions-for-clause-36-3-12-3-coding.docx](https://mentor.ieee.org/802.11/dcn/21/11-21-0324-00-00be-comment-resolutions-for-clause-36-3-12-3-coding.docx). |

be editor: please make the following changes in D0.3 *Clause 36.3.12.7*:

* On P298L36 (CID #3115):

Exchange the order of subclause LDPC tone mapper and Constellation mapping.

**36.3.12.-7 Constellation mapping**

**36.3.12.-8 LDPC tone mapper**

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| 3116 | 36.3.12.7 | 300.35 | Since LDPC tone mapping is not performed on BCC coded streams, why using t(k,l) instead of k in equation (36-65)? Please change t(k,l) to k. | As in comment | **Accepted.**  Agree with the commentor that tone indices of LDPC tone mapper input and output in Equation (36-35) shall be the same since LDPC tone mapping is not performed on BCC coded streams.  TGbe editor: Incorporate the changes in [https://mentor.ieee.org/802.11/dcn/21/11-21-0324-01-00be-comment-resolutions-for-clause-36-3-12-3-coding.docx](https://mentor.ieee.org/802.11/dcn/21/11-21-0324-00-00be-comment-resolutions-for-clause-36-3-12-3-coding.docx). |

be editor: please make the following changes in D0.3 *Clause 36.3.12.3.3*:

* On P300L35 (CID #3116):

Since LDPC tone mapping is not performed on BCC coded streams, for BCC coded spatial streams, Equation (36-65) applies.

(36-35)

where