IEEE P802.11  
Wireless LANs

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| CID Resolution – Part XI | | | | |
| Date: 2018-09-14 | | | | |
| Author(s): | | | | |
| Name | Affiliation | Address | Phone | email |
| Artyom Lomayev | Intel | Turgeneva 30, Nizhny Novgorod 603024, Russia | +7 (831) 2969444 | artyom.lomayev@intel.com |
| Alexander Maltsev | Intel |  |  | alexander.maltsev@intel.com |
| Claudio da Silva | Intel |  |  | claudio.da.silva@intel.com |
| Carlos Cordeiro | Intel |  |  | carlos.cordeiro@intel.com |
|  |  |  |  |  |

Abstract

This document proposes resolutions for the CIDs 3311, 3382, 3312, 3313, 3314, 3315, 3316, 3331, 3332, 3333, 3334, 3375, 3376, 3596, 3622, 3704, 3377, 3623, 3705, 3201, 3378, 3624, 3706, 3202, 3625, 3301, 3732, 3175, 3720, 3721, 3724, 3212, 3213, 3178, 3179, 3725, 3214, 3730, 3722, 3602, 3381, 3380, 3268, 3177, 3180, 3181, 3172, 3173, 3174, 3183, 3090, 3091, 3166, 3740, 3086, 3092, 3093, 3088, 3087, 3089, 3130, 3120, 3121, 3122, 3123, 3062, 3064, 3065, (68). The text used as reference is D2.0, [1].

**CID 3311**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Clause Number(C)** | | **Page(C)** | | **Line(C)** | | **Comment** | | **Proposed Change** | |
| 29.3.7 Control trailer | 400 | | 1 | | Field definitions refer to wrong table. | | Definitions for fields "SISO/MIMO", "SU/MU MIMO", and "EDMG Group ID" should refer to Table 76. | |

*Resolution:*

Accepted.

**CID 3382**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Clause Number(C)** | | **Page(C)** | | **Line(C)** | | **Comment** | | **Proposed Change** | |
| 29.3.7 | 401 | | 1 | | Table 77 should be changed to Table 76 | | as per comment | |

*Resolution:*

Accepted.

*Editor: p 401, line 1, Table 77, correct the reference as below*

Table 77—Control trailer definition when CT\_TYPE is GRANT\_RTS\_CTS2self

|  |  |  |  |
| --- | --- | --- | --- |
| Field | Number of bits | Start bit | Description |
| Channel Aggregation | 1 | 0 | See Table 53 |
| BW | 8 | 1 | See Table 53 |
| Primary Channel Number | 3 | 9 | See Table 53 |
| SISO/MIMO | 1 | 12 | See Table 76 |
| SU/MU MIMO | 1 | 13 | See Table 76 |
| TX Sector Combination Index | 6 | 14 | Indicates the TX sector combination (as defined in 9.4.2.253) and the corresponding RX AWVs to be used in the following SU-MIMO transmission. Reserved if the SISO/MIMO field is 0 or the SU/MU MIMO field is 1. |
| EDMG Group ID | 8 | 20 | See Table 76 |
| MU-MIMO Transmission Configuration Type | 1 | 28 | Corresponds to the TXVECTOR parameter MU\_MIMO\_TX\_CONFIG\_TYPE. Set to 1 to indicate that the MU-MIMO transmission configuration was obtained from the reciprocal MU-MIMO BF training; set to 0 to indicate that the MU-MIMO transmission configuration was obtained from the non-reciprocal MU-MIMO BF training. Reserved if the SISO/MIMO field is 0 or the SU/MU MIMO field is 0. |
| MU-MIMO Transmission Configuration Index | 3 | 29 | Corresponds to the TXVECTOR parameter MU\_MIMO\_TX\_CONFIG\_INDEX. Indicates the MU-MIMO transmission configuration (as defined in 9.4.2.261) to be used in the following MU-MIMO transmission. Reserved if the SISO/MIMO field is 0 or the SU/MU MIMO field is 0. |
| Total Number of Sectors MSB | 4 | 32 | This field is prepended to the Total Number of Sectors subfield in the BF Control field to form a single 11 bits field indicating the total number of sectors the initiator or the responder uses during an SLS. This field is reserved and set to 0 when the PPDU does not carry a Grant or Grant Ack frame with the Beamforming Training field equal to 1. |
| Number of RX DMG Antennas MSB | 1 | 36 | This field is prepended to the Number of RX DMG Antennas subfield in the BF Control field to form a single 3 bits field indicating the total number of repetitions of the TXSS that the initiator or the responder uses during the SLS. This field is reserved and set to 0 when the PPDU does not carry a Grant or Grant Ack frame with the Beamforming Training field equal to 1. |
| Reserved | 91 | 37 | Set to 0 by the transmitter and ignored by the receiver. |
| CTCS | 16 | 128 | Control Trailer Check Sequence (CTCS) is a CRC-16 computed over the content of the control trailer. The CRC-16 is computed as defined in section 20.3.7. |

**CID 3312**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Clause Number(C)** | | **Page(C)** | | **Line(C)** | | **Comment** | | **Proposed Change** |
| 29.6.10.3.3 EDMG preamble, Data and TRN fields tra | 510 | | 1 | | Additional "+" symbol(s) in formula when continued onto the next line in the document. Appears to be a typo/formatting issue. | | Remove any unnecessary '+' in the formula at the point(s) where the text/line wrap occurs. Page 502, line 3 is an example of a correct line/text wrap without the unnecessary '+' symbol within the formula. | | |

*Resolution:*

Revised.

*Editor: p 510, line 1, delete unnecessary “+” in the first row*



**CID 3313**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Clause Number(C)** | | **Page(C)** | | **Line(C)** | | **Comment** | | **Proposed Change** | |
| 29.6.10.3.3 EDMG preamble, Data and TRN fields tra | 510 | | 12 | | Additional "+" symbol(s) in formula when continued onto the next line in the document. Appears to be a typo/formatting issue. | | Remove any unnecessary '+' in the formula at the point(s) where the text/line wrap occurs. Page 502, line 3 is an example of a correct line/text wrap without the unnecessary '+' symbol within the formula. | |

*Resolution:*

Revised.

*Editor: p 510, line 12, delete unnecessary “+” in the first row*



**CID 3314**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Clause Number(C)** | | **Page(C)** | | **Line(C)** | | **Comment** | | **Proposed Change** | |
| 29.6.10.4.3 EDMG preamble, Data and TRN fields tra | 512 | | 1 | | Additional "+" symbol(s) in formula when continued onto the next line in the document. Appears to be a typo/formatting issue. | | Remove any unnecessary '+' in the formula at the point(s) where the text/line wrap occurs. Page 502, line 3 is an example of a correct line/text wrap without the unnecessary '+' symbol within the formula. | |

*Resolution:*

Revised.

*Editor: p 512, line 1, delete unnecessary “+” in the first row*



**CID 3315**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Clause Number(C)** | | **Page(C)** | **Line(C)** | **Comment** | | **Proposed Change** |
| 29.12.3.3 TXTIME calculation for EDMG SC mode | 639 | 20 | Additional "+" symbol(s) in formula when continued onto the next line in the document. Appears to be a typo/formatting issue. | | Remove any unnecessary '+' in the formula at the point(s) where the text/line wrap occurs. Page 502, line 3 is an example of a correct line/text wrap without the unnecessary '+' symbol within the formula. | |

*Resolution:*

Revised.

*Editor: p 639, line 20, delete unnecessary “+” in the first row*



**CID 3316**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Clause Number(C)** | | **Page(C)** | | **Line(C)** | **Comment** | **Proposed Change** | |
| 29.12.3.3 TXTIME calculation for EDMG SC mode | 454 | 14 | Additional "+" symbol(s) in formula when continued onto the next line in the document. Appears to be a typo/formatting issue. | | | | Remove any unnecessary '+' in the formula at the point(s) where the text/line wrap occurs. Page 459, line 1 is an example of a correct line/text wrap without the unnecessary '+' symbol within the formula. |

*Resolution:*

Revised.

*Editor: p 454, line 14, delete unnecessary “+” in the first row*



**CID 3331**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Clause Number(C)** | **Page(C)** | **Line(C)** | **Comment** | **Proposed Change** |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 29.6.10.3.3 EDMG preamble, Data and TRN fields tra | 510 | 12 | Additional "+" symbol(s) in formula when continued onto the next line in the document. Appears to be a typo/formatting issue. | Remove any unnecessary '+' in the formula at the point(s) where the text/line wrap occurs. Page 502, line 3 is an example of a correct line/text wrap without the unnecessary '+' symbol within the formula. |

*Resolution:*

Revised.

*Editor: p 510, line 12, delete unnecessary “+”*



**CID 3332**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Clause Number(C)** | | | **Page(C)** | | **Line(C)** | **Comment** | **Proposed Change** |
| 29.6.10.4.3 EDMG preamble, Data and TRN fields tra | 512 | 1 | | Additional "+" symbol(s) in formula when continued onto the next line in the document. Appears to be a typo/formatting issue. | | | Remove any unnecessary '+' in the formula at the point(s) where the text/line wrap occurs. Page 502, line 3 is an example of a correct line/text wrap without the unnecessary '+' symbol within the formula. | |

*Resolution:*

Revised.

*Editor: p 512, line 1, delete unnecessary “+” in the first row*



**CID 3333**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Clause Number(C)** | | | **Page(C)** | | **Line(C)** | **Comment** | **Proposed Change** | |
| 29.12.3.3 TXTIME calculation for EDMG SC mode | 639 | 20 | | Additional "+" symbol(s)(s) in formula when continued onto the next line in the document. Appears to be a typo/formatting issue. | | | | Remove any unnecessary '+' in the formula at the point(s) where the text/line wrap occurs. Page 502, line 3 is an example of a correct line/text wrap without the unnecessary '+' symbol within the formula. | |

*Resolution:*

Revised.

*Editor: p 639, line 20, delete unnecessary “+” in the first row*



**CID 3334**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Clause Number(C)** | | **Page(C)** | | **Line(C)** | **Comment** | **Proposed Change** | | |
| 29.6.9.3.2 Transmission in EDMG format | 499 | 14 | Additional multiplication symbol in formula when continued onto the next line in the document. Appears to be a typo error/extra multiplication symbol. | | | | Remove unnecessary multiplication symbol in the formula at the point(s) where the text/line wrap occurs. |

*Resolution:*

Revised.

*Editor: p 499, line 14, delete unnecessary “\*” in the first row*



**CID 3375**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Clause Number(C)** | | | **Page(C)** | | **Line(C)** | **Comment** | **Proposed Change** | | |
| 29.2.4.1 | 358 | 12 | | Clause 30 PHY service interface should be changed to Clause 29 PHY service interface. | | | | as per comment |

*Resolution:*

Accepted.

*Editor: p 358, line 12, change the reference to “Clause 30” with the reference to “Clause 29”*

An EDMG STA logically encompasses Clause 20 and Clause 29 PHYs. The MAC interfaces to the PHY via the Clause 29 PHY service interface, which in turn interacts with Clause 20 PHY service interface. The EDMG PHY TXVECTOR and RXVECTOR defined in 29.2.2 structurally include all fields of the DMG TXVECTOR and RXVECTOR accordingly defined in 20.2.2. The EDMG PHY TXSTATUS vector is identical to the TXSTATUS vector defined for DMG PHY in 20.2.3. The EDMG PHYCONFIG\_VECTOR defined in 29.2.3 structurally includes all fields of the DMG PHYCONFIG\_VECTOR.

**CID 3376**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Clause Number(C)** | | | **Page(C)** | | **Line(C)** | **Comment** | **Proposed Change** | | |
| 29.2.4.2 | 359 | 1 | | change "clause 30" to "clause 29" in Figure 153 | | | | as per comment |

*Resolution:*

Accepted.

**CID 3596**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Clause Number(C)** | | | **Page(C)** | | **Line(C)** | **Comment** | **Proposed Change** | | |
| 29.2.4.2 | 359 | 1 | | In Figure 153, all Clause 30. should be changed to Clause 29. | | | | Change all 30 to 29 |

*Resolution:*

Accepted.

**CID 3622**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Clause Number(C)** | | | **Page(C)** | | **Line(C)** | **Comment** | **Proposed Change** | | |
| 29.2.4.2 | 359 |  | | Incorrect Clause referred | | | | In Figure 153, EDMG and Non-EDMG modes are defined in Clause 29 |

*Resolution:*

Accepted.

**CID 3704**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Clause Number(C)** | | | **Page(C)** | | **Line(C)** | **Comment** | **Proposed Change** | | |
| 29.2.4.2 | 359 | 3 | | Figure 153 references to clause 30 whereas the text describes clause 29 | | | | Change every reference to clause 30 to clause 29 in Figure 153 |

*Resolution:*

Accepted.

*Editor: p 359, line 1, the updated Figure 153 is shown below for convenience*



Figure 153 — EDMG STA PHY interaction on transmit for various PPDU formats

**CID 3377**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Clause Number(C)** | | | **Page(C)** | | **Line(C)** | **Comment** | **Proposed Change** | | |
| 29.2.4.3 | 360 | 6 | | change "clause 30" to "clause 29" in Figure 154 | | | | as per comment |

*Resolution:*

Accepted.

**CID 3623**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Clause Number(C)** | | | **Page(C)** | | **Line(C)** | **Comment** | **Proposed Change** | | |
| 29.2.4.2 | 360 |  | | Incorrect Clause referred | | | | In Figure 154, EDMG modes are defined in Clause 29 |

*Resolution:*

Accepted.

**CID 3705**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Clause Number(C)** | | **Page(C)** | | **Line(C)** | | **Comment** | **Proposed Change** | | |
| 29.2.4.3 | 360 | | 9 | | Figure 154 references to clause 30 whereas the text describes clause 29 | | | Change every reference to clause 30 to clause 29 in Figure 154 |

*Resolution:*

Accepted.

**CID 3201**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Clause Number(C)** | | **Page(C)** | | **Line(C)** | | **Comment** | **Proposed Change** | | |
| 29.2.4.3 | 360 | | 7 | | In figure 154 repalce clause 30 with clause 92. | | | replace clause 30 with clause 29 |

*Resolution:*

Accepted.

*Editor: p 360, line 6, the updated Figure 154 is shown below for convenience*



Figure 154 — EDMG STA PHY interaction on receive for various PPDU formats

**CID 3378**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Clause Number(C)** | | | **Page(C)** | | **Line(C)** | **Comment** | **Proposed Change** | | |
| 29.2.4.4 | 362 | 1 | | change "clause 30" to "clause 29" in Figure 155 | | | | as per comment |

*Resolution:*

Accepted.

**CID 3624**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Clause Number(C)** | | | **Page(C)** | | **Line(C)** | **Comment** | **Proposed Change** | | |
| 29.2.4.2 | 362 |  | | Incorrect Clause referred | | | | In Figure 155, EDMG modes are defined in Clause 29 |

*Resolution:*

Accepted.

**CID 3706**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Clause Number(C)** | | **Page(C)** | | **Line(C)** | | **Comment** | **Proposed Change** | | |
| 29.2.4.4 | 362 | | 2 | | Figure 155 references to clause 30 whereas the text describes clause 29 | | | Change every reference to clause 30 to clause 29 in Figure 155 |

*Resolution:*

Accepted.

**CID 3202**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Clause Number(C)** | | **Page(C)** | | **Line(C)** | | **Comment** | **Proposed Change** | | |
| 29.2.4.4 | 362 | | 1 | | In figure 155 repalce clause 30 with clause 92. | | | replace clause 30 with clause 29 |

*Resolution:*

Accepted.

*Editor: p 362, line 1, the updated Figure 155 is shown below for convenience*



Figure 155 — EDMG STA PHY interaction on channel bandwidth configuration for Clause 29 and Clause 20 PHYs

**CID 3625**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Clause Number(C)** | | **Page(C)** | | **Line(C)** | | **Comment** | **Proposed Change** | | |
| 29.2.4.2 | 362 | |  | | Incorrect parameter designation | | | In Figure 155, change "PHYVECTOR\_CONFIG" to "PHYCONFIG\_VECTOR" |

*Resolution:*

Accepted.

*Editor: p 362, line 1, change the “PHYVECTOR\_CONFIG” with the “PHYCONFIG\_VECTOR” notation in the figure below*



Figure 155 — EDMG STA PHY interaction on channel bandwidth configuration for Clause 29 and Clause 20 PHYs

**CID 3301**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Clause Number(C)** | | **Page(C)** | | **Line(C)** | | **Comment** | **Proposed Change** | | |
| 29.2.4 |  | |  | | change "clause 30" to "clause 29" in figue 153, 154,155 | | | as comments |

*Resolution:*

Accepted.

*Note to the Editor:*

The resolution for CID 3301 combines the resolutions for CIDs 3376, 3377, and 3378. Please see above.

**CID 3732**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Clause Number(C)** | | **Page(C)** | | **Line(C)** | | **Comment** | **Proposed Change** | | |
| 29.6.4.2 | 486 | | 4 | | (11) should not appear at the end of the defintion of EDMG-STF | | | remove (11) |

*Resolution:*

Accepted.

**CID 3175**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Clause Number(C)** | | **Page(C)** | | **Line(C)** | | **Comment** | **Proposed Change** | | |
| 29.6.4.2 | 486 | | 4 | | Equation number (11) is not consistent with rest of text | | | Remove equation numnber or add it everywhere else |

*Resolution:*

Revised.

*Editor: p 486, line 4, remove the equation number*

For EDMG OFDM transmissions using a single 2.16 GHz channel, the frequency sequence used to construct the EDMG-STF field for the *iSTSth* space-time stream is given by:



**CID 3720**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Clause Number(C)** | | **Page(C)** | | **Line(C)** | | **Comment** | **Proposed Change** | | |
| 29.6.2.6 | 481 | | 10 | | SP should be the subscript of N in P\_NSP | | | As comment, also apply to line 8, 12, 22, and a global search and change is needed. |

*Resolution:*

Revised.

*Editor: p 481, line 8, replace the notation/equation below with the corrected one*

The pilot value  depends on the iSTSth space-time stream number, *n*th OFDM symbol, and *k*th subcarrier index and defined as follows:



where:

 defines pilot for *iSTS*th space-time stream and *k*th subcarrier

*W(iSTS, n)* × (2×*p(n)* – 1) defines a common phase shift (over subcarriers) for the *iSTS*th space-time stream and *n*th OFDM symbol, *p(n)* defines a bit coming from the scrambler defined in 29.6.9.1 with shift register x1, x2,…, x7 initialized to all ones at the zeroth (i.e., *n* = 0) OFDM symbol

*NSTS* defines the total number of space-time streams

*Editor: p 481, line 22, replace the notation below with the corrected one*

The pilot sequence  for given number of contiguous channel bandwidth, *NCB*, is defined in Table 99.

Table 99—Pilot sequence () definition

|  |  |
| --- | --- |
| NCB | *)* |
| 1 | *P16(iSTS, :)* |
| 2 | *P36*(*iSTS, :*) = [*P12*(*iSTS, :*), *P12*(*iSTS, :*), *P12*(*iSTS, :*)] |
| 3 | *P56*(*iSTS, :*) = [*P16*(*iSTS, :*), *P12*(*iSTS, :*), *P12*(*iSTS, :*), *P16*(*iSTS, :*)] |
| 4 | *P76*(*iSTS, :*) = [*P16*(*iSTS, :*), *P16*(*iSTS, :*), *P12*(*iSTS, :*), *P16*(*iSTS, :*), *P16*(*iSTS, :*)] |

*Editor: p 508, line 22, replace the notation below with the corrected one*

In the above procedure, index *n* = 0, 1, …, *NSYM* / 2– 1, pilot sequences  and  are defined in 29.6.2.6 and *p*(*n*) defines a bit coming from the scrambler defined in 29.6.9.1 with shift register x1, x2,…, x7 initialized to all ones for the *n* = 0 OFDM symbol.

**CID 3721**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Clause Number(C)** | | **Page(C)** | | **Line(C)** | | **Comment** | **Proposed Change** | | |
| 29.6.5.1 | 487 | | 5 | | STS should be the subscript of i in iSTS | | | As comment |

*Resolution:*

Revised.

*Editor: p 487, line 5, replace the notations with the corrected ones as shown below*

 and , the sequences of length *N* used in the definition of the EDMG-CEF field for different space-time streams, are defined in 29.11.2.

**CID 3724**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Clause Number(C)** | | **Page(C)** | | **Line(C)** | | **Comment** | **Proposed Change** | | |
| 29.6.9.3.3 | 500 | | 9 | | Typo of the equation | | | Typo should be revised |

**CID 3212**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Clause Number(C)** | | **Page(C)** | | **Line(C)** | | **Comment** | **Proposed Change** | | |
| 29.6.9.3.3 | 500 | | 8 | | The formulas in in lines 8 and 9 are misprinted. It is not clear why Q is Q% and the formula in line 9 has something printed over it. | | | correct formulas! |

**CID 3213**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Clause Number(C)** | | **Page(C)** | | **Line(C)** | | **Comment** | **Proposed Change** | | |
| 29.6.9.3.3 | 500 | | 8 | | The Letter Q is overloaded as a mapping Matrix for spatial streams, use other letter (e.g. Z) | | | replace Q by Z |

**CID 3178**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Clause Number(C)** | | | **Page(C)** | | **Line(C)** | **Comment** | **Proposed Change** | | |
| 2 | 29.6.9.3.3 | 500 | | Extra floating text/equations behind Q and DCM matrix | | | | Remove extra text/equations |

**CID 3179**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Clause Number(C)** | | **Page(C)** | | **Line(C)** | **Comment** | **Proposed Change** | | |
| 29.6.9.3.5 | 500 | |  | Extra floating text/equations behind Q and DCM matrix | | | Remove extra text/equations |

*Resolution for CIDs 3724, 3212, 3213, 3178, 3179:*

Revised.

*Editor: introduce changes on p 500, line 9 as specified below*

The input encoded bits belonging to the iSSth spatial stream are broken into the groups of NCBPS bits, , where *q* denotes the group number. Each pair of bits , k = 0, 1, …, NSD/2 – 1, is converted into the pair of complex points . The modulation is performed in two steps:

* First, two BPSK points are modulated as , 
* Second, two BPSK points  are converted to two QPSK points  by multiplication on mapping matrix as follows: , 

where index *P(k)* is defined in the range *NSD*/2 to *NSD* – 1, as described in 29.6.9.3.9. The *qth* modulated data block of the *iSSth* spatial stream is mapped to *NSD* data subcarriers of the *qth* OFDM symbol of the *iSSth* spatial stream.

**CID 3725**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Clause Number(C)** | | **Page(C)** | | **Line(C)** | | **Comment** | **Proposed Change** | | |
| 29.6.9.3.5 | 501 | | 17 | | Typo of the equation | | | Typo should be revised |

**CID 3214**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Clause Number(C)** | | **Page(C)** | | **Line(C)** | | **Comment** | **Proposed Change** | | |
| 29.6.9.3.5 | 501 | | 8 | | The formulas in in lines 16 and 17 are misprinted. It is not clear why Q is Q% and the formula in line 17 has something printed over it. | | | correct formulas! |

*Resolution for CIDs 3725 and 3214:*

Revised.

*Editor: introduce changes on p 501, line 17 as specified below*

The input encoded bits of the *iSSth* spatial stream are broken into the groups of *NCBPS* bits, , where *q* denotes the group number. Each four bits , *k* = 0, 1, …, *NSD*/2 – 1, are converted into the pair of complex points . The modulation is performed in two steps:

* First, two QPSK points are modulated as , 
* Second, two QPSK points  are converted to two 16-QAM points  by multiplication on mapping matrix as follows: , 

where index *P(k)* is defined in the range *NSD*/2 to *NSD* – 1, as described in 29.6.9.3.9. The *qth* modulated data block of the *iSSth* spatial stream is mapped to *NSD* data subcarriers of the *qth* OFDM symbol of the *iSSth* spatial stream.

**CID 3730**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Clause Number(C)** | | **Page(C)** | | **Line(C)** | | **Comment** | **Proposed Change** | | |
| 29.5.5.2 | 426 | | 12 | | For N\_STS=1, P\_EDMG-CEF should equal [+1]. | | | update P\_EDMG-CEF accordingly for N\_STS=1. |

*Resolution:*

Rejected.

*Discussion:*

The EDMG-CEF mapping matrix for *NSTS* = 1, 2 is defined as .

In case of N\_STS = 1, the first row of the matrix above is considered. This is a general assumption throughout the draft and valid for other cases on p 426 – 427 as well.

**CID 3722**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Clause Number(C)** | | **Page(C)** | | **Line(C)** | | **Comment** | **Proposed Change** | | |
| 29.6.9.2.1 | 494 | | 5 | | "defines the mth data word" should be in line with the general LDPC description | | | change to "defines the data bits of mth LDPC codeword", and "parity bits of mth LDPC codeword" |

*Resolution:*

Revised.

*Editor: introduce changes on p 494, line 5 as specified below*

The LDPC encoding with codeword length LCW = 672 and 1344 is performed by solving the linear system of equations  defined by the parity matrix H of size LCWP by LCW, where  defines the mth LDPC codeword,  defines the data bits of mth LDPC codeword (or data word), and  defines parity bits for mth LDPC codeword.

**CID 3602**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Clause Number(C)** | | **Page(C)** | | **Line(C)** | | **Comment** | **Proposed Change** | |
| 29.5.9.4.4 | 445 | | 11 | | For MU PPDU padding, the specific content of pad SC symbols should be clarified, like packet extension field of 11ax | | | Add "The pad SC symbols, when present, shall be transmitted with the same average power as the Data field, and shall not cause significant power leakage outside of the spectrum used by the Data field. Other than that, the contents are arbitrary." | |

*Resolution:*

Rejected.

*Discussion:*

The procedure for the data padding is defined in (**29.5.9.4.3 LDPC encoding**). This is not like packet extension field in the 11ax.

**CID 3381**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Clause Number(C)** | | **Page(C)** | | **Line(C)** | | **Comment** | | **Proposed Change** | |
| 29.3.4 | 388 | | 11 | | For channel configuration 17-19, dot11CurrentChannelCenterFrequencyIndex0 should be set to 3 (#17) instead of 11(#6). | | as per comment | |

*Resolution:*

Accepted.

*Editor: p 388, line 11, replace 11(#6) entry in the table with the 3(#17) as specified below*

Table 62 —2.16 GHz, 4.32 GHz, 6.48 GHz, and 8.64 GHz channels used by an EDMG STA

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Channel configuration #** | **dot11**  **Current**  **Channel**  **Width** | **dot11**  **Current**  **Channel**  **Center**  **Frequency**  **Index0** | **dot11**  **Current**  **Primary**  **Channel** | **dot11**  **Current**  **Channel**  **Center**  **Frequency**  **Index1** |
| 1 | 2.16 GHz | 1 (#1) | 1 (#1) | N/A |
| 2 | 3 (#2) | 3 (#2) |
| 3 | 5 (#3) | 5 (#3) |
| 4 | 7 (#4) | 7 (#4) |
| 5 | 9 (#5) | 9 (#5) |
| 6 | 11 (#6) | 11 (#6) |
| 7 | 4.32 GHz | 2 (#9) | 1 (#1) |
| 8 | 3 (#2) |
| 9 | 4 (#10) | 3 (#2) |
| 10 | 5 (#3) |
| 11 | 6 (#11) | 5 (#3) |
| 12 | 7 (#4) |
| 13 | 8 (#12) | 7 (#4) |
| 14 | 9 (#5) |
| 15 | 10 (#13) | 9 (#5) |
| 16 | 11 (#6) |
| 17 | 6.48 GHz | 3 (#17) | 1 (#1) |
| 18 | 3 (#2) |
| 19 | 5 (#3) |
| 20 | 5 (#18) | 3 (#2) |
| 21 | 5 (#3) |
| 22 | 7 (#4) |
| 23 | 7 (#19) | 5 (#3) |
| 24 | 7 (#4) |
| 25 | 9 (#5) |
| 26 | 9 (#20) | 7 (#4) |
| 27 | 9 (#5) |
| 28 | 11 (#6) |
| 29 | 8.64 GHz | 4 (#25) | 1 (#1) |
| 30 | 3 (#2) |

**CID 3380**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Clause Number(C)** | | **Page(C)** | | **Line(C)** | | **Comment** | | **Proposed Change** | |
| 29.3.3.3.2.4 | 383 | | 16 | | what does "the last but one 8 parity bits" mean? | | use "the second last 8 parity bits" instead of "the last but one 8 parity bits" | |

*Resolution:*

Revised.

*Editor: p 383, line 16, replace “the last but one” with the “the second last”*

* Remove zero bits and discard (puncture) the second to last 8 parity bits to create a codeword  of length 224 bits and then XOR with a PN sequence that is generated from the LFSR used for data scrambling defined in 20.3.9. The LFSR is initialized to the all 1s vector.

**CID 3268**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Clause Number(C)** | | **Page(C)** | | **Line(C)** | | **Comment** | | **Proposed Change** | |
| 29.4.7.2 | 409 | | 2 | | The CSD definitions don't seem to cover 4.32 GHz and wider channels. | | Define CSD for wide channels. | |

*Resolution:*

Rejected.

*Discussion:*

The transmission with CSD is defined for the signal transmitted over the 2.16 GHz bandwidth. For the wider channels, a duplicate transmission is used. So, each duplicated channel uses the CSD definition introduced for a 2.16 GHz channel. So, the CSD for the wider channels is defined.

**CID 3177**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Clause Number(C)** | | **Page(C)** | | **Line(C)** | | **Comment** | **Proposed Change** | | |
| 29.6.9.2.4 | 497 | | 3 | | Extra words | | | Remove "to achieve this" |

*Resolution:*

Accepted.

*Editor: p 497, line 3, remove “to achieve this” as specified below*

For an MU PPDU transmission, all user PPDUs shall be aligned in time. If necessary, user PSDUs shall be padded according to the following steps:

**CID 3180**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Clause Number(C)** | | **Page(C)** | | **Line(C)** | | **Comment** | **Proposed Change** | | |
| 29.6.9.3.8 | 505 | |  | | Formating is incorrect | | | Paragraph should be left justified |

*Resolution:*

Accepted.

*Editor: p 505, correct text formatting as specified below*

y(k) is initialized to the value 0 at (,****) including a first bit of the LDPC codeword, otherwise y(k) is incremented by 1 for every (,) inside the LDPC codeword.

The DTP mapping defines P(k) index as follows:



where:

**CID 3181**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Clause Number(C)** | | **Page(C)** | | **Line(C)** | **Comment** | **Proposed Change** | | |
| 29.6.9.3.9 | 506 | |  | Formating is incorrect | | | Paragraph should be left justified |

*Resolution:*

Accepted.

*Editor: p 506, correct text formatting as specified below*

The tone index offset is defined as follows:



where:

 is the value of the GroupPairIndex subfield defined in a DTP Report element (9.4.2.146) included in the last received DTP Report frame (9.6.20.9)

**CID 3172**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Clause Number(C)** | | **Page(C)** | | **Line(C)** | **Comment** | **Proposed Change** | | |
| 29.6.2.6 | 481 | |  | Parentheses should not be italicized | | | Un-italicize parentheses |

*Resolution:*

Revised.

*Editor: introduce changes on p 481 as specified below*

The pilot sequence *P*(*iSTS*, *n*, *k*) is created by inserting a sequence of zeros corresponding to tones –*NSR* to *NSR*. The pilots are then inserted at the tone indexes *Mp*(*k*) defined in 29.6.2.4, which are frequency channel dependent, but independent on the space-time stream or OFDM symbol number as follows:



The pilot value *PNSP*(*iSTS, n, k*) depends on the iSTSth space-time stream number, *n*th OFDM symbol, and *k*th subcarrier index and defined as follows:

*PNSP*(*iSTS, n, k*) = *W*(*iSTS*, *n* mod *NSTS*) × (2×*p*(*n*) – 1) × *PNSP*(*iSTS, k*)

where:

*PNSP*(*iSTS, k*) defines pilot for *iSTS*th space-time stream and *k*th subcarrier

*W*(*iSTS, n*) × (2×*p*(*n*) – 1) defines a common phase shift (over subcarriers) for the *iSTS*th space-time stream and *n*th OFDM symbol, *p*(*n*) defines a bit coming from the scrambler defined in 29.6.9.1 with shift register x1, x2,…, x7 initialized to all ones at the zeroth (i.e., *n* = 0) OFDM symbol

*NSTS* defines the total number of space-time streams

The common phase shift is composed as a product of deterministic shift *W*(*iSTS, n*) repeated with period *NSTS* over the time and random shift defined by (2×*p*(*n*) – 1) which is scrambler output dependent. The random component depends on the *n*th OFDM symbol number only and does not depend on the particular *iSTS*th space-time stream number.

The pilot sequence *PNSP*(*iSTS, :*) for given number of contiguous channel bandwidth, *NCB*, is defined in Table 99.

Table 99—Pilot sequence (PNSP) definition

|  |  |
| --- | --- |
| NCB | *PNSP*(*iSTS, :*) |
| 1 | *P16*(*iSTS, :*) |
| 2 | *P36*(*iSTS, :*) = [*P12*(*iSTS, :*), *P12*(*iSTS, :*), *P12*(*iSTS, :*)] |
| 3 | *P56*(*iSTS, :*) = [*P16*(*iSTS, :*), *P12*(*iSTS, :*), *P12*(*iSTS, :*), *P16*(*iSTS, :*)] |
| 4 | *P76*(*iSTS, :*) = [*P16*(*iSTS, :*), *P16*(*iSTS, :*), *P12*(*iSTS, :*), *P16*(*iSTS, :*), *P16*(*iSTS, :*)] |

The pilot sequence *P16*(*iSTS, :*) and *P12*(*iSTS, :*) are defined in Table 100.

Table 100—Pilot sequence (P16 and P12) definition

|  |  |  |
| --- | --- | --- |
| *iSTS* | *P16*(*iSTS, :*) | *P12*(*iSTS, :*) |
| 1 | [+1 +1 +1 -1 +1 +1 -1 +1 +1 +1 +1 -1 -1 -1 +1 -1] | [-1 +1 -1 +1 +1 -1 -1 -1 -1 -1 +1 +1] |
| 2 | [-1 -1 -1 +1 -1 -1 +1 -1 +1 +1 +1 -1 -1 -1 +1 -1] | [+1 -1 +1 +1 -1 -1 -1 -1 -1 +1 +1 -1] |
| 3 | [-1 -1 -1 +1 +1 +1 -1 +1 -1 -1 -1 +1 -1 -1 +1 -1] | [-1 +1 +1 -1 -1 -1 -1 -1 +1 +1 -1 +1] |
| 4 | [+1 +1 +1 -1 -1 -1 +1 -1 -1 -1 -1 +1 -1 -1 +1 -1] | [+1 +1 -1 -1 -1 -1 -1 +1 +1 -1 +1 -1] |
| 5 | [-1 -1 +1 -1 -1 -1 -1 +1 -1 -1 +1 -1 +1 +1 +1 -1] | [+1 -1 -1 -1 +1 -1 -1 +1 -1 +1 -1 +1] |
| 6 | [+1 +1 -1 +1 +1 +1 +1 -1 -1 -1 +1 -1 +1 +1 +1 -1] | [-1 -1 +1 -1 -1 -1 +1 +1 -1 -1 +1 +1] |
| 7 | [+1 +1 -1 +1 -1 -1 -1 +1 +1 +1 -1 +1 +1 +1 +1 -1] | [-1 -1 -1 +1 -1 +1 -1 +1 +1 +1 +1 +1] |
| 8 | [-1 -1 +1 -1 +1 +1 +1 -1 +1 +1 -1 +1 +1 +1 +1 -1] | [-1 -1 -1 -1 +1 -1 +1 -1 +1 +1 +1 -1] |

The deterministic component of common phase shift, *W*(*iSTS, n*), is defined as , where *NSYM* is the total number of OFDM symbols.

**CID 3173**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Clause Number(C)** | | **Page(C)** | | **Line(C)** | | **Comment** | **Proposed Change** | | |
| 29.6.3.1 | 482 | | 14 | | Reference to "It" is unclear | | | Replace "It pads the data" with "Data is padded" |

*Resolution:*

Accepted.

*Editor: p 482, line 14, Replace "It pads the data" with "Data is padded” as specified below*

An EDMG OFDM PPDU transmission may be generated using a transmitter consisting of the following blocks:

1. Scrambler scrambles the data to reduce the probability of long sequences of 0s and 1s; see 29.6.9.1.
2. LDPC encoder encodes the data to enable error correction. Data is padded with zeros to get an integer number of codewords and OFDM symbols; see 29.6.9.2.

**CID 3174**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Clause Number(C)** | | **Page(C)** | | **Line(C)** | | **Comment** | **Proposed Change** | | |
| 29.6.3.1 | 483 | | 7 | | "onto" should be used instead of "into" when talking about mapping to transmit chains | | | Replace "into" with "onto" |

*Resolution:*

Accepted.

*Editor: p 483, line 7, replace “into” with the “onto” as specified below*

* 1. Direct mapping: constellation points from each space-time stream are mapped directly onto the transmit chains.

**CID 3183**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Clause Number(C)** | | **Page(C)** | | **Line(C)** | | **Comment** | **Proposed Change** | |
| 29.6.11.1.2 | 514 | | 1418 | | Magic numbers | | | Replace 1760x10^6 and 80 with references to values in some Table | |

*Resolution:*

Revised.

*Editor: introduce changes on p 642, line 30 as specified below*

* + 1. EDMG PHY characteristics

The static EDMG PHY characteristics, provided through the PLME-CHARACTERISTICS service primitive, shall be as shown in Table 20-28 (DMG PHY characteristics) unless otherwise listed in Table 153. The definitions for these characteristics are given in 6.5 (PLME SAP interface).

Table153—EDMG PHY characteristics

|  |  |
| --- | --- |
| PHY parameter | Value |
| aTxPHYDelay | Implementation dependent |
| aRxPHYDelay | Implementation dependent |
| aCCATime | Implementation dependent |
| aBRPminOFDMblocks | 20 |
| aDMGChipRate | 1760 MHz |
| aDMGTimeOfDepartureAccuracyThresh | 80 ns |

*Editor: introduce changes on p 514, line 14 and 18 as specified below*

The Time of Departure accuracy test evaluates TIME\_OF\_DEPARTURE against aTxPHYTxStartRMS and aTxPHYTxStartRMS against TIME\_OF\_DEPARTURE\_ACCURACY\_TEST\_THRESH as defined in Annex P with the following test parameters:

* MULTICHANNEL\_SAMPLING\_RATE is set to aDMGChipRate.
* FIRST\_TRANSITION\_FIELD is L-STF of the waveform transmitted in the primary channel.
* SECOND\_TRANSITION\_FIELD is L-CEF of the waveform transmitted in the primary channel.
* TRAINING\_FIELD is L-CEF of the waveform transmitted in the primary channel.
* TIME\_OF\_DEPARTURE\_ACCURACY\_TEST\_THRESH is set to aDMGTimeOfDepartureAccuracyThresh.

*Editor: introduce changes on p 474, line 5 and 9 as specified below*

The Time of Departure accuracy test evaluates TIME\_OF\_DEPARTURE against aTxPHYTxStartRMS and aTxPHYTxStartRMS against TIME\_OF\_DEPARTURE\_ACCURACY\_TEST\_THRESH as defined in Annex P with the following test parameters:

* MULTICHANNEL\_SAMPLING\_RATE is set to aDMGChipRate.
* FIRST\_TRANSITION\_FIELD is L-STF of the waveform transmitted in the primary channel.
* SECOND\_TRANSITION\_FIELD is L-CEF of the waveform transmitted in the primary channel.
* TRAINING\_FIELD is L-CEF of the waveform transmitted in the primary channel.
* TIME\_OF\_DEPARTURE\_ACCURACY\_TEST\_THRESH is set to aDMGTimeOfDepartureAccuracyThresh.

**CID 3090**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Clause Number(C)** | | **Page(C)** | | **Line(C)** | | **Comment** | **Proposed Change** | | |
|  |  | |  | | The index for Γêåt1 (deltat1), Γêåt2 (deltat2), Γêåt3 (deltat3) and Γêåt4 (deltat4) should be a subscript to stay consistent with equations | | | Replace Γêåt1 (deltat1), Γêåt2 (deltat2), Γêåt3 (deltat3) and Γêåt4 (deltat4) with Γêåt\_1 (deltat\_1), Γêåt\_2 (deltat\_2), Γêåt\_3 (deltat\_3) and Γêåt\_4 (deltat\_4) |

**CID 3091**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Clause Number(C)** | | **Page(C)** | | **Line(C)** | | **Comment** | **Proposed Change** | | |
|  |  | |  | | Γêåt (deltat) for the primary channel should have a generic index associated with, i.e., it should be Γêåt\_i (deltat\_i) where i an index to the primary channel | | | Replace Γêåt (deltat) with Γêåt\_i (deltat\_i) |

*Resolution for CIDs 3090 and 3091:*

Revised.

*Editor: introduce changes on p 411, line 8 as specified below*

where:

∆*F* defines the channel spacing and is equal to 2.16 GHz

∆*t*1 and ∆*t*2 are in the range [0, *Tc*]

∆*t*i equal to 0 corresponds to the primary channel

*Editor: introduce changes on p 411, line 22 as specified below*

where:

∆*t*1, ∆*t*2, and ∆*t*3 are in the range [0, *Tc*]

∆*t*i equal to 0 corresponds to the primary channel

*Editor: introduce changes on p 412, line 3 as specified below*

where:

∆*t*1, ∆*t*2, ∆*t*3, and ∆*t*4 are in the range [0, *Tc*]

∆*t* equal to 0 corresponds to the primary channel

*Editor: introduce changes on p 414, line 16 as specified below*

where:

*∆F* defines the channel spacing and is equal to 2.16 GHz

*∆t*1 and *∆t*2 are in the range [0, *Tc*]

*∆t*i equal to 0 corresponds to the primary channel

*Editor: introduce changes on p 415, line 2 as specified below*

where:

*∆t*1, *∆t*2, and *∆t*3 are in the range [0, *Tc*]

*∆t*i equal to 0 corresponds to the primary channel

*Editor: introduce changes on p 415, line 10 as specified below*

where:

*∆t*1, *∆t*2, *∆t*3, and *∆t*4 are in the range [0, *Tc*]

*∆t*i equal to 0 corresponds to the primary channel

*Editor: introduce changes on p 454, line 15 as specified below*

where:

∆*F* defines the channel spacing and is equal to 2.16 GHz

∆*t*1 and ∆*t*2 are in the range [0, *Tc*]

∆*t*i equal to 0 corresponds to the primary channel

*Editor: introduce changes on p 455, line 2 as specified below*

where:

∆*t*1, ∆*t*2 and ∆*t*3 are in the range [0, *Tc*]

∆*t*i equal to 0 corresponds to the primary channel

*Editor: introduce changes on p 455, line 9 as specified below*

where:

∆*t*1, ∆*t*2, ∆*t*3 and ∆*t*4 are in the range [0, *Tc*]

∆*t*i equal to 0 corresponds to the primary channel

*Editor: introduce changes on p 463, line 14 as specified below*

where:

∆*F* defines the channel spacing and is equal to 2.16 GHz

∆*t*1 and ∆*t*2 are in the range [0, *Tc*]

∆*t*i equal to 0 corresponds to the primary channel

*Editor: introduce changes on p 464, line 2 as specified below*

where:

∆*t*1, ∆*t*2 and ∆*t*3 are in the range [0, *Tc*]

∆*t*i equal to 0 corresponds to the primary channel

*Editor: introduce changes on p 464, line 9 as specified below*

where:

∆*t*1, ∆*t*2, ∆*t*3 and ∆*t*4 are in the range [0, *Tc*]

∆*t*i equal to 0 corresponds to the primary channel

**CID 3166**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Clause Number(C)** | | **Page(C)** | | **Line(C)** | **Comment** | **Proposed Change** | | |
| 29.5.9.5.2 |  | |  | DCM is applied on spatial streams, not space-time streams | | | Replace "first space-time stream" with "first spatial stream", "second space-time stream" with "second spatial stream", "i\_STS = 1" with "i\_SS = 1" and "i\_STS = 2" with "i\_SS = 2" |

*Resolution:*

Revised.

*Editor: introduce changes on p 446 and 447as specified below*

29.5.9.5.2 Dual carrier modulation (DCM) π/2-BPSK

A frequency domain diversity scheme based on DCM π/2-BPSK may be applied to an EDMG PPDU transmission over 2.16+2.16 GHz or 4.32+4.32 GHz channels. An EDMG STA shall only apply DCM π/2-BPSK to an EDMG PPDU transmitted to a peer EDMG STA if the DCM π/2-BPSK Supported field in the peer STA’s EDMG Capabilities element is one.

The DCM π/2-BPSK modulation is applied to an EDMG PPDU if, in the EDMG-Header-A, the BW field indicates a bandwidth configuration 2.16+2.16 GHz or 4.32+4.32 GHz, the Channel Aggregation field is set to one, the Number of SS field indicates 2 spatial streams, and the DCM BPSK Applied field is set to one. The value of the Differential EDMG-MCS1 and Differential EDMG-MCS2 fields in the EDMG-Header-A shall be the same. The resulting EDMG-MCS index shall be in the range from 2 to 6 as defined in Table 84.

The DCM π/2-BPSK modulation is defined as follows:

* After LDPC encoding, the bit stream of the first spatial stream (*iSS* = 1) and the second spatial stream (*iSS* = 2) is broken into two groups of N*CBPB*×NCB bits as  and  respectively, where *q* denotes the SC symbol block number and *q* =0,1,…N*BLKS* – 1. NCBPB is defined as in Table 90 for the π/2-BPSK case, NCB = 1 for a 2.16+2.16 GHz channel and NCB = 2 for a 4.32+4.32 GHz channel.
* Each pair of bits  of the qth SC data block, k=0,1,NCBPB×NCB – 1, is converted into a pair of constellation points  and .
* Finally, the qth SC data block of the first spatial stream , k = 0, 1, …, NCBPB×NCB – 1, is assigned to the channel containing the primary 2.16 GHz channel and the second spatial stream , k = 0, 1, …, NCBPB×NCB – 1, is assigned to the channel that does not contain the primary channel.

The DCM π/2-BPSK modulation uses the same symbol blocking structure as for an SU PPDU defined in 29.5.9.2.2.3.

**CID 3740**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Clause Number(C)** | | **Page(C)** | | **Line(C)** | | **Comment** | **Proposed Change** | |
| General |  | |  | | The terminology of DCM is a bit confusing because it is inconsistent with that in 11ax. For example, BPSK DCM in 11ax D3.0 uses BPSK modulation for each of dual carriers and the data rate is half of BPSK without DCM, while DCM BPSK in 11ay D2.0 uses QPSK modulation for each of dual carriers and the data rate is the same as BPSK without DCM. | | | Rename "DCM pi/2-BPSK", "DCM BPSK" and "DCM QPSK" to "pi/2-QPSK DCM", "QPSK DCM" and "16-QAM DCM respectively". | |

*Resolution:*

Rejected.

*Discussion:*

It was already discussed in the group. The decision was voted to have the naming conventions as today in D2.0.

**CID 3086**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Clause Number(C)** | | **Page(C)** | | **Line(C)** | | **Comment** | **Proposed Change** | | |
|  |  | |  | | Magic number: 1.76 GHz is everywhere, and should be replaced by a variable | | | Replace 1.76 GHz with Fc\_{EDMG, N\_CB=1} |

**CID 3092**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Clause Number(C)** | | **Page(C)** | | **Line(C)** | | **Comment** | **Proposed Change** | | |
|  |  | |  | | Magic number: 1.76x10^3 should be replaced by a variable | | | Replace 1.76x10^3 with Fc\_{EDMG, N\_CB=1} / 1 MHz |

**CID 3093**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Clause Number(C)** | | **Page(C)** | | **Line(C)** | | **Comment** | **Proposed Change** | | |
|  |  | |  | | Magic number: 2.64x10^3 should be replaced by a variable | | | Replace 2.64x10^3 with Fc\_{EDMG, N\_CB=1} / 1 MHz |

*Resolution for CIDs 3086, 3092 and 3093:*

Revised.

*Editor: introduce changes on p 642, line 30 as specified below*

* + 1. EDMG PHY characteristics

The static EDMG PHY characteristics, provided through the PLME-CHARACTERISTICS service primitive, shall be as shown in Table 20-28 (DMG PHY characteristics) unless otherwise listed in Table 153. The definitions for these characteristics are given in 6.5 (PLME SAP interface).

Table153—EDMG PHY characteristics

|  |  |
| --- | --- |
| PHY parameter | Value |
| aTxPHYDelay | Implementation dependent |
| aRxPHYDelay | Implementation dependent |
| aCCATime | Implementation dependent |
| aBRPminOFDMblocks | 20 |
| aDMGChipRate | 1760 MHz |
| aDMGTimeOfDepartureAccuracyThresh | 80 ns |
| aDMGChipTimeDuration | 1/1760 us |
| aDMGSampleTimeDuration | 1/2640 us |

*Editor: introduce changes on p 525, line 1 as specified below*



where:









*LL-Header* = 5



For an EDMG and non-EDMG PPDU transmission, the RXTIME computation using the above equation shall cause a spoofing error less than or equal to 0.15 µs, except for PPDU durations between 347.56 µs and 347.93 µs and between 349.10 µs and 350.76 µs where the maximum spoofing error can be 0.37 µs and 1.66 µs, respectively, as defined in 29.3.3.2.4.1. Spoofing error is defined as the difference between the PPDU duration calculated based on the L-Header and the actual PPDU duration.

For an EDMG STA and EDMG and non-EDMG SC mode PPDUs, the RXTIME parameter shall be computed using the Base MCS, Length, Extended SC MCS Indication, and Training Length fields of the L-Header (see Table 20-17).

The RXTIME parameter shall be defined in microseconds as follows:



where:











The number of SC symbol blocks, , shall be as defined in 20.6.3.2.3.3.

In case of a DMG A-PPDU reception (i.e., Additional PPDU field is equal to 1), the RXTIME parameter shall be updated every time when receiving the next L-Header field. In case of an EDMG A-PPDU, the RXTIME parameter predicts the reception time for the entire EDMG A-PPDU. In both cases, the TRN field can be appended only once at the very end of the A-PPDU.

For an EDMG and non-EDMG PPDU transmission, the RXTIME computation using the above equation shall cause a spoofing error less than one SC symbol block, i.e.,  as defined in 29.3.3.2.4.1. Spoofing error is defined as the difference between the PPDU duration calculated based on the L-Header and the actual PPDU duration.

*Editor: introduce changes on p 635, line 27 as specified below*









 = 5 octets

 = 9 octets

 = 3 octets

The parameter Length (EDMG\_LENGTH in TXVECTOR) indicates the number of data octets in the PSDU and ranges from 14 – 1023.

If the CH\_BANDWIDTH parameter indicates a bandwidth configuration equal to CBW216, the number of space-time streams NUM\_STS is equal to 1, and DMG-TRN parameter is equal to 1, then the TRN field duration is defined as follows:



The EDMG\_TRN\_LEN parameter indicates the length of the training field in the range 0 – 31.

For other values of the CH\_BANDWIDTH parameter, the TRN field duration is defined as follows:



where:



If EDMG\_TRN\_LEN > 0, EDMG-TRN-T-PACKET or EDMG-TRN-R/T-PACKET, then ,  and 

If EDMG\_TRN\_LEN > 0, EDMG-TRN-R-PACKET, then ,  and 

If EDMG\_TRN\_LEN = 0, then , , and 

If the TRN\_SEQ\_LENGTH parameter is equal to NORMAL, then TRN\_BL is set to 128. If the TRN\_SEQ\_LENGTH parameter is equal to LONG, then TRN\_BL is set to 256. If the TRN\_SEQ\_LENGTH parameter is equal to SHORT, then TRN\_BL is set to 64.

*Editor: introduce changes on p 637, line 23 as specified below*







If NUM\_USERS = 1, CH\_BANDWIDTH = CBW216, and NUM\_STS = 1, then 

If NUM\_USERS ≥ 1, CH\_BANDWIDTH ≠ CBW216 and/or NUM\_STS ≠ 1, then 

If NUM\_USERS = 1, CH\_BANDWIDTH = CBW216, and NUM\_STS = 1, then  and 

If NUM\_USERS ≥ 1, CH\_BANDWIDTH ≠ CBW216 and/or NUM\_STS ≠ 1, then  and 

If NUM\_USERS = 1, then 

If NUM\_USERS > 1, then 



*Editor: introduce changes on p 639, line 22 as specified below*













If NUM\_USERS = 1, then 

If NUM\_USERS > 1, then 







If EDMG\_TRN\_LEN > 0, EDMG-TRN-T-PACKET or EDMG-TRN-R/T-PACKET, then ,  and 

If EDMG\_TRN\_LEN > 0 and EDMG-TRN-R-PACKET, then ,  and 

If EDMG\_TRN\_LEN = 0, then ,  and 

*Editor: introduce changes on p 641, line 15 as specified below*



*Editor: introduce changes on p 641, line 27 as specified below*









 = 5 octets



The parameter Length (LENGTH parameter in the TXVECTOR) indicates the number of data octets in the PSDU in the range 14 – 1023. The TRN\_LEN parameter indicates the length of the training field in the range 0 – 16.

*Editor: introduce changes on p 642, line 10 as specified below*











*Editor: introduce changes on p 364, line 1, Table 44, row 17, as specified below*

|  |  |
| --- | --- |
|  | Shaping filter impulse response defined at the *Nup*×*Fc* sampling rate, *Fc* is defined in 29.5.2.2 |

*Editor: introduce changes on p 367, line 13 as specified below*

The non-EDMG portion of the EDMG format preamble includes the L-STF, L-CEF and L-Header fields. These fields are defined at the SC chip rate *Fc* in 20.4.3.1.2, 20.3.6.2, 20.3.6.3, 20.4.3.2, and 20.6.3.1.

*Editor: introduce changes on p 373, line 25 as specified below*

The EDMG portion of the EDMG format preamble includes the EDMG-Header-A, EDMG-STF, EDMG-CEF and EDMG-Header-B fields. The EDMG-Header-A field is defined at the SC chip rate *Fc*. The EDMG-STF, EDMG-CEF and EDMG-Header-B fields are not always transmitted as part of an EDMG PPDU transmission.

*Editor: introduce changes on p 406, line 14 as specified below*

The non-EDMG portion of the EDMG control mode PPDU is composed of the L-STF, the L-CEF, and the L-Header. These fields are defined at the chip rate *Fc* and transmitted in the EDMG control

*Editor: introduce changes on p 407, line 9 as specified below*

The EDMG-Header-A and the Data fields are defined at the chip rate *Fc* and transmitted in the EDMG control mode for 2.16 GHz and 2.16+2.16 GHz channels, and in the EDMG duplicate control mode for 4.32 GHz, 6.48 GHz, 8.64 GHz, and 4.32+4.32 GHz channels as defined in 29.4.7.3.1 and 29.4.7.3.2.

*Editor: introduce changes on p 409, line 3 as specified below*

The non-EDMG control mode PPDU waveform shall be defined at the SC chip rate *Fc* and include the following modulated fields:

*Editor: introduce changes on p 410, line 5 as specified below*

The non-EDMG PPDU waveform for *iTXth* transmit chain is obtained by up-sampling and filtering and then appropriate carrier frequency shift of the  waveform, if required. The up-sampling procedure is applied using a factor of *Nup*. The filtering procedure is performed with a pulse shaping filter  defined at the *Nup*×*Fc* sampling rate as follows:

*Editor: introduce changes on p 412, line 16 as specified below*

The preamble and Data field shall be defined at the SC chip rate *Fc* and include the following modulated fields:

*Editor: introduce changes on p 413, line 16 as specified below*

The EDMG PPDU waveform for the *iTXth* transmit chain is obtained by up-sampling and filtering and then appropriate carrier frequency shift of the  waveform, if required. The up-sampling procedure is applied using a factor of *Nup*. The filtering procedure is performed with a pulse shaping filter  defined at the *Nup*×*Fc* sampling rate as follows:

*Editor: introduce changes on p 413, line 16 as specified below*

The TRN field, , shall be defined at the SC chip rate equal to *NCB*×*Fc* per *iTXth* transmit chain as defined in 29.9.2.2.6. The TRN field is defined using *NTX* orthogonal waveforms and transmitted over the entire channel bandwidth.

*Editor: introduce changes on p 415, line 16 as specified below*

The TRN field, , shall be defined at the SC chip rate equal to *NCB*×*Fc* per *iTXth* transmit chain as defined in 29.9.2.2.6. The TRN field is defined using *NTX* orthogonal waveforms and transmitted over the entire channel bandwidth.

*Editor: introduce changes on p 416, line 26 as specified below*

The EDMG control mode PPDU shall be defined at the SC chip rate *Fc* and include the following modulated fields:

*Editor: introduce changes on p 417, line 25 as specified below*

The EDMG PPDU waveform for the *iTXth* transmit chain is obtained by up-sampling and filtering. The up-sampling procedure is applied using a factor of *Nup*. The filtering procedure is performed with a pulse shaping filter  defined at the *Nup*×*Fc* sampling rate as follows:

*Editor: introduce changes on p 419, line 16, Table 80, as specified below*

Table 80 provides a summary of the EDMG SC mode timing related parameters.

Table 80—EDMG SC mode timing related parameters

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Parameter | Value | | | |
| *NCB* = 1 | *NCB* = 2 | *NCB* = 3 | *NCB* = 4 |
| *NSPB*: Number of symbols per SC symbol block for short GI length | 480 | 960 | 1440 | 1920 |
| *NSPB*: Number of symbols per SC symbol block for normal GI length | 448 | 896 | 1344 | 1792 |
| *NSPB*: Number of symbols per SC symbol block for long GI length | 384 | 768 | 1152 | 1536 |
| *NGI* short: short guard interval length | 32 | 64 | 96 | 128 |
| *NGI normal*: normal guard interval length | 64 | 128 | 192 | 256 |
| *NGI long*: long guard interval length | 128 | 256 | 384 | 512 |
| *Fc*: DMG SC chip rate | 1.76 GHz | 1.76 GHz | 1.76 GHz | 1.76 GHz |
| *Fc EDMG*: EDMG SC chip rate | 1.76 GHz | 3.52 GHz | 5.28 GHz | 7.04 GHz |
| *Tc*: DMG SC chip time duration | 0.57 ns | 0.57 ns | 0.57 ns | 0.57 ns |
| *Tc EDMG*: EDMG SC chip time duration | 0.57 ns | 0.28 ns | 0.19 ns | 0.14 ns |
| *NDFT:* DFT size | 512 | 1024 | 1536 | 2048 |
| *TDFT*: SC IDFT/DFT period | 0.291 µs | 0.291 µs | 0.291 µs | 0.291 µs |
| *TGI short*: short guard interval duration | 18.18 ns | 18.18 ns | 18.18 ns | 18.18 ns |
| *TGI normal*: normal guard interval duration | 36.36 ns | 36.36 ns | 36.36 ns | 36.36 ns |
| *TGI long*: long guard interval duration | 72.72 ns | 72.72 ns | 72.72 ns | 72.72 ns |

NOTE—The non-EDMG and pre-EDMG modulated fields are defined at the DMG SC chip rate *Fc* and the corresponding chip time duration *Tc* . The EDMG modulated fields are defined at the EDMG SC chip rate *Fc EDMG* = *Fc*×*NCB* and the corresponding chip time duration *Tc EDMG* = *Tc*/*NCB*.

*Editor: introduce changes on p 424, line 6 as specified below*

The EDMG-STF field transmit waveform in time domain shall be defined at the EDMG SC chip rate *Fc EDMG* and chip time duration *Tc EDMG*. The EDMG-STF field for the *iTX*th transmit chain is defined as follows:

*Editor: introduce changes on p 425, line 8 as specified below*

The EDMG-CEF field transmit waveform in time domain shall be defined at the EDMG SC chip rate *Fc EDMG* and chip time duration *Tc EDMG*. The EDMG-CEF field is composed of  subfields and *n*th subfield for the *iTX*th transmit chain is defined as follows:

*Editor: introduce changes on p 431, line 7 as specified below*

Three types of GIs are defined: short, normal and long. An EDMG STA shall support the normal GI for each combination of channel bandwidth and number of spatial streams supported by the EDMG STA. All GI sequences are defined at the *NCB*×*Fc* sampling rate, where *NCB* is the integer number of 2.16 GHz channels that make up the channel bandwidth and 1 ≤ *NCB* ≤ 4.

*Editor: introduce changes on p 433, line 12 as specified below*

An SU PPDU transmitted over a 2.16 GHz or a 2.16+2.16 GHz channel with a single space-time stream (*NSTS* = 1) shall be defined at the SC chip rate *Fc*. The PPDU of this type does not include the EDMG-STF and EDMG-CEF fields and the symbol blocking structure defined for the Data field continues the symbol blocking structure of the pre-EDMG fields.

*Editor: introduce changes on p 434, line 3 as specified below*

An SU PPDU transmitted over a 2.16 GHz or 2.16+2.16 GHz channel with more than one space-time stream (*NSTS* > 1) and an SU PPDU transmission over a 4.32 GHz, 6.48 GHz, 8.64 GHz or 4.32+4.32 GHz channel with one or more space-time streams (*NSTS* ≥ 1) shall be defined at the *NCB*×*Fc* sampling rate.

*Editor: introduce changes on p 434, line 8 as specified below*

The symbol blocking structure for pre-EDMG fields transmitted over a 2.16 GHz or 2.16+2.16 GHz channel shall be defined at the SC chip rate *Fc* as shown in Figure 173.

*Editor: introduce changes on p 436, line 14 as specified below*

The symbol blocking structure for pre-EDMG fields transmitted over a 2.16 GHz or 2.16+2.16 GHz channel shall be defined at the SC chip rate *Fc* as shown in Figure 173.

*Editor: introduce changes on p 452, line 22 as specified below*

The non-EDMG PPDU waveform shall be defined at the SC chip rate *Fc* and include the following modulated fields:

*Editor: introduce changes on p 453, line 17 as specified below*

The non-EDMG waveform for the *iTXth* transmit chain is obtained by up-sampling and filtering and then appropriate carrier frequency shift of the  waveform, if required. The up-sampling procedure is applied using a factor of *Nup*. The filtering procedure is performed with a pulse shaping filter defined at the *Nup*×*Fc* sampling rate as follows:

*Editor: introduce changes on p 457, line 29 as specified below*

The TRN field, , shall be defined at the SC chip rate *Fc* per *iTXth* transmit chain as defined in 29.9.2.2.6.

*Editor: introduce changes on p 458, line 9 as specified below*

The filtering procedure is performed with a pulse shaping filter, , defined at the *Nup*×*Fc* sampling rate as follows:

*Editor: introduce changes on p 460, line 29 as specified below*

The filtering procedure is performed with a pulse shaping filter, , defined at the *Nup*×*Fc* sampling rate as follows:

*Editor: introduce changes on p 462, line 20 as specified below*

The waveform for the pre-EDMG fields for *iTXth* transmit chain is obtained by up-sampling and filtering and then appropriate carrier frequency shift of the  waveform, if required. The up-sampling procedure is applied using a factor of *Nup*. The filtering procedure is performed with a pulse shaping filter defined at the *Nup*×*Fc* sampling rate as:

*Editor: introduce changes on p 464, line 16 as specified below*

For a single PPDU transmission, the EDMG modulated field of the EDMG preamble and Data field of an SU PPDU is defined for the *iSTSth* space-time stream at the *Fc EDMG* chip rate and includes the following modulated fields:

*Editor: introduce changes on p 465, line 7 as specified below*

For an EDMG A-PPDU transmission of *NPPDU* PPDUs, the EDMG modulated field of the EDMG preamble and Data field of an SU PPDU is defined for *iSTS*th space-time stream at the *Fc EDMG* chip rate and includes the following modulated fields:

*Editor: introduce changes on p 466, line 23 as specified below*

The TRN field, , shall be defined at the SC chip rate equal to *Fc EDMG* per *iTXth* transmit chain as defined in 29.9.2.2.6.

*Editor: introduce changes on p 468, line 18 as specified below*

The EDMG preamble, EDMG-Header-B and Data field of an EDMG MU PPDU is defined for *iSTSth* space-time stream at the *Fc EDMG* chip rate and includes the following modulated fields:

*Editor: introduce changes on p 469, line 11 as specified below*

The TRN field, , shall be defined at the SC chip rate equal to *Fc EDMG* per *iTXth* transmit chain as defined in 29.9.2.2.6.

*Editor: introduce changes on p 475, line 1, Table 95, as specified below*

Table 95—EDMG OFDM mode timing related parameters

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Parameter | Value | | | |
| *NCB* = 1 | *NCB* = 2 | *NCB* = 3 | *NCB* = 4 |
| *NSD*: Number of data subcarriers | 336 | 734 | 1134 | 1532 |
| *NSP*: Number of pilot subcarriers | 16 | 36 | 56 | 76 |
| *NDC*: Number of DC subcarriers | 3 | 3 | 3 | 3 |
| *NST*: Total number of subcarriers | 355 | 773 | 1193 | 1611 |
| *NSR*: Number of subcarriers occupying half of the overall bandwidth | 177 | 386 | 596 | 805 |
| *NGI short*: short guard interval length | 48 | 96 | 144 | 192 |
| *NGI normal*: normal guard interval length | 96 | 192 | 288 | 384 |
| *NGI long*: long guard interval length | 192 | 384 | 576 | 768 |
| ∆*F*: Subcarrier frequency spacing | 5.15625 MHz | 5.15625 MHz | 5.15625 MHz | 5.15625 MHz |
| *Fs*: EDMG OFDM sample rate | 2.64 GHz | 5.28 GHz | 7.92 GHz | 10.56 GHz |
| *Ts*: EDMG OFDM sample time duration | 0.38 ns | 0.19 ns | 0.13 ns | 0.09 ns |
| *NDFT:* DFT size | 512 | 1024 | 1536 | 2048 |
| *TDFT*: OFDM IDFT/DFT period | 0.194 µs | 0.194 µs | 0.194 µs | 0.194 µs |
| *TGI short*: short guard interval duration | 18.18 ns | 18.18 ns | 18.18 ns | 18.18 ns |
| *TGI normal*: normal guard interval duration | 36.36 ns | 36.36 ns | 36.36 ns | 36.36 ns |
| *TGI long*: long guard interval duration | 72.72 ns | 72.72 ns | 72.72 ns | 72.72 ns |

*Editor: introduce changes on p 475, line 3 as specified below*

The pre-EDMG modulated fields are defined at the DMG SC chip rate *Fc* and the corresponding chip time duration *Tc* (see Table 80). Then, the resampling procedure is applied with 3/2 sample rate conversion ratio to achieve the effective sample rate of (3/2)×*Fc* and sample time duration of (2/3)×1/*Fc*.

The EDMG modulated fields are defined at the EDMG OFDM sample rate *Fs* = 2.64×*NCB* GHz and the corresponding sample time duration *Ts* = 1/(2.64×*NCB*) ns.

**CID 3088**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Clause Number(C)** | | **Page(C)** | | **Line(C)** | | **Comment** | **Proposed Change** | | |
|  |  | |  | | Magic number: 2.64 GHz is everywhere, and should be replaced by a variable | | | Replace 2.64GHz with Fs |

*Resolution:*

Revised.

*Editor: introduce changes on p 486, line 14 as specified below*

The EDMG-STF field transmit waveform in time domain shall be defined at the OFDM sampling rate *Fs* and sample time duration *Ts* as follows:

*Editor: introduce changes on p 487, line 20 as specified below*

The EDMG-CEF field transmit waveform in time domain shall be defined at the OFDM sampling rate *Fs* and sample time duration *Ts* as follows:

*Editor: introduce changes on p 499, line 12 as specified below*

The EDMG data transmit waveform for *iTX*th transmit chain in time domain shall be defined at the OFDM sampling rate *Fs* and sample time duration *Ts* as follows:

*Editor: introduce changes on p 509, line 33 as specified below*

For a single PPDU transmission, the EDMG modulated field of the EDMG preamble, Data field and TRN field of an SU PPDU is defined for the *iTX*th transmit chain at the *Fs* sampling rate and sample time duration *Ts*, and includes the following modulated fields:

*Editor: introduce changes on p 510, line 9 as specified below*

For an EDMG A-PPDU transmission of *NPPDU* PPDUs, the EDMG modulated field of the EDMG preamble, Data and TRN fields of an SU PPDU is defined for *iTX*th transmit chain at the *Fs* sampling rate, sample time duration *Ts*, and includes the following modulated fields:

*Editor: introduce changes on p 511, line 30 as specified below*

The EDMG preamble, Data field and TRN field of an MU PPDU is defined for the *iTXth* transmit chain at the *Fs* sampling rate and sample time duration *Ts* and includes the following modulated fields:

*Editor: introduce changes on p 538, line 7 as specified below*

The basic OFDM TRN subfield waveform for the *iTXth* transmit chain in time domain shall be defined at the OFDM sampling rate *Fs* and sample time duration *Ts* as follows:

**CID 3087**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Clause Number(C)** | | **Page(C)** | | **Line(C)** | | **Comment** | **Proposed Change** | | |
|  |  | |  | | Magic number: 0.57 ns should be replaced by a variable | | | Replace 0.57 ns with Tc\_{EDMG, N\_CB=1} |

*Resolution:*

Rejected.

*Discussion:*

The “magic” number 0.57 ns is introduced in the (**29.5.2.2 Timing related parameters**) and (**29.6.2.2 Timing related parameters**) only, where variable Tc is defined. Other cases are not discovered.

**CID 3089**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Clause Number(C)** | | **Page(C)** | | **Line(C)** | | **Comment** | **Proposed Change** | | |
|  |  | |  | | Magic number: 0.38 ns should be replaced by a variable | | | Replace 0.38 ns with Ts |

*Resolution:*

Rejected.

*Discussion:*

The “magic” number 0.38 ns is introduced in the (**29.6.2.2 Timing related parameters**) only, where variable Ts is defined. Other cases are not discovered.

**CID 3130**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Clause Number(C)** | | **Page(C)** | | **Line(C)** | | **Comment** | **Proposed Change** | | |
| 29.3.4 |  | |  | | Replace 1.08 with Γêåf (deltaf) | | | Replace the magic number "1.08" with "Γêåf" or "(deltaf)" |

*Resolution:*

Revised.

*Editor: introduce changes on p 387, line 13 as specified below*

The current center frequency for the channel containing the primary 2.16 GHz channel is defined as follows:

*Channel center frequency0 [GHz] = (Channel starting frequency +* Δ*f) +* Δ*f × dot11CurrentChannelCenterFrequencyIndex0*

where:

*Channel starting frequency* is given by the operating class (see Annex E)

For 2.16+2.16 GHz and 4.32+4.32 GHz channel configurations, the current center frequency for the channel containing the secondary 2.16 GHz channels only is defined as follows:

*Channel center frequency1 [GHz] = (Channel starting frequency +* Δ*f) +* Δ*f × dot11CurrentChannelCenterFrequencyIndex1*

For 4.32 GHz, 6.48 GHz, and 8.64 GHz channels, the dot11CurrentChannelCenterFrequencyIndex1 is not defined and is marked as N/A in Table 62.

The center frequency of the primary 2.16 GHz channel is given by equation:

*Primary 2.16 GHz channel center frequency [GHz] = (Channel starting frequency +* Δ*f) +* Δ*f × dot11CurrentPrimaryChannel*

**CID 3120**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Clause Number(C)** | | **Page(C)** | | **Line(C)** | **Comment** | **Proposed Change** | | |
| 29.2.4.2 | 359 | | 1 | Figure 153: changing "C\_MODE" and "SC\_MODE" to "DMG\_C\_MODE" and "DMG\_SC\_MODE" will add more clarity to figure and spec | | | In Figure 153, replace "C\_MODE" with "DMG\_C\_MODE" and "SC\_MODE" with "DMG\_SC\_MODE" |

**CID 3121**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Clause Number(C)** | | **Page(C)** | | **Line(C)** | | **Comment** | **Proposed Change** | | |
| 29.2.4.2 | 359 | | 1718 | | Changing "C\_MODE" and "SC\_MODE" to "DMG\_C\_MODE" and "DMG\_SC\_MODE" will add more clarity to figure and spec | | | Replace "C\_MODE" with "DMG\_C\_MODE" and "SC\_MODE" with "DMG\_SC\_MODE" |

**CID 3122**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Clause Number(C)** | | **Page(C)** | | **Line(C)** | | **Comment** | **Proposed Change** | | |
| 29.2.4.3 | 360 | | 6 | | Figure 154: changing "C\_MODE" and "SC\_MODE" to "DMG\_C\_MODE" and "DMG\_SC\_MODE" will add more clarity to figure and spec | | | In Figure 154, replace "C\_MODE" with "DMG\_C\_MODE" and "SC\_MODE" with "DMG\_SC\_MODE" |

**CID 3123**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Clause Number(C)** | | **Page(C)** | | **Line(C)** | | **Comment** | **Proposed Change** | | |
| 29.2.4.3 | 361 | | 1416 | | Changing "C\_MODE" and "SC\_MODE" to "DMG\_C\_MODE" and "DMG\_SC\_MODE" will add more clarity to figure and spec | | | Replace "C\_MODE" with "DMG\_C\_MODE" and "SC\_MODE" with "DMG\_SC\_MODE" |

*Resolution for CIDs 3120, 3121, 3122, and 3123:*

Revised.

*Editor: p 339, line 1, Table 43, row 3, rename SC\_MODE to DMG\_SC\_MODE and C\_MODE to DMG\_C\_MODE as specified below*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| NON\_EDMG\_MODULATION | FORMAT is NON\_EDMG | In TXVECTOR, indicates the format type of the transmitted non-EDMG PPDU.  In RXVECTOR, indicates the estimated format type of the received non-EDMG PPDU.  Enumerated type:  DMG\_C\_MODE indicates Clause 20 control mode format  DMG\_SC\_MODE indicates Clause 20 SC mode format  NON\_EDMG\_DUP\_C\_MODE indicates non-EDMG duplicate format of the Clause 20 control mode format  NON\_EDMG\_DUP\_SC\_MODE indicates non-EDMG duplicate format of the Clause 20 SC mode format | Y | Y |

*Editor: p 359, line 3, Figure 153, rename SC\_MODE to DMG\_SC\_MODE and C\_MODE to DMG\_C\_MODE, the updated Figure 153 is provided below for convenience*



Figure 153 — EDMG STA PHY interaction on transmit for various PPDU formats

*Editor: p 359, line 17, rename SC\_MODE to DMG\_SC\_MODE and C\_MODE to DMG\_C\_MODE as specified below*

If the FORMAT parameter is set to NON\_EDMG and NON\_EDMG\_MODULATION is set to either DMG\_C\_MODE or DMG\_SC\_MODE, then Clause 20 PHY entity is used for transmission. The TXVECTOR content is filtered out while transferring to the Clause 20 PHY entity to keep the DMG fields only to define the TXVECTOR in accordance with DMG PHY SAP interface (see 20.2.2). If NON\_EDMG\_MODULATION is set to the DMG\_C\_MODE, then the DMG control mode defined in 20.4 is selected. If NON\_EDMG\_MODULATION is set to the DMG\_SC\_MODE, then the DMG SC mode defined in 20.6 is selected.

*Editor: p 360, line 6, Figure 154, rename SC\_MODE to DMG\_SC\_MODE and C\_MODE to DMG\_C\_MODE, the updated Figure 154 is provided below for convenience*



Figure 154 — EDMG STA PHY interaction on receive for various PPDU formats

*Editor: p 361, line 12, rename SC\_MODE to DMG\_SC\_MODE and C\_MODE to DMG\_C\_MODE as specified below*

If the FORMAT is NON\_EDMG, then Clause 20 PHY entity is used for reception. If the FORMAT is NON\_EDMG and PHY entity detects the Gb Golay sequence in the L-STF field, then the NON\_EDMG\_MODULATION parameter is set to the DMG\_C\_MODE. If the FORMAT is NON\_EDMG and the PHY entity detects the Ga Golay sequence in the L-STF field, then the NON\_EDMG\_MODULATION parameter is set to the DMG\_SC\_MODE. The RXVECTOR content is augmented with the EDMG fields to define the RXVECTOR in accordance with EDMG PHY SAP interface (see 29.2.2). The augmented RXVECTOR is passed to the EDMG PHY SAP interface.

*Editor: p 472, line 29, rename SC\_MODE to DMG\_SC\_MODE as specified below*

Transmit requirements of PPDUs transmitted with TXVECTOR parameter NON\_EDMG\_MODULATION equal to DMG\_SC\_MODE are defined in 20.6.4.

*Editor: p 515, line 13, rename SC\_MODE to DMG\_SC\_MODE and C\_MODE to DMG\_C\_MODE as specified below*

* The second path is selected if the FORMAT parameter is non-EDMG. In this case, the modulation is defined by NON\_EDMG\_MODULATION parameter. If NON\_EDMG\_MODULATION is set to DMG\_C\_MODE or DMG\_SC\_MODE, then it indicates control mode or SC mode defined in Clause 20, respectively. If NON\_EDMG\_MODULATION is set to NON\_EDMG\_DUP\_C\_MODE or NON\_EDMG\_DUP\_SC\_MODE, then it indicates non-EDMG duplicate control mode or non-EDMG duplicate SC mode defined in subclauses 29.4 and 29.5, respectively.

*Editor: p 642, line 6, rename SC\_MODE to DMG\_SC\_MODE as specified below*

If the NON\_EDMG\_MODULATION parameter is equal to DMG\_SC\_MODE or NON\_EDMG\_DUP\_SC\_MODE, the TXTIME parameter shall be defined in microseconds (µs) as follows:

*Editor: p 641, line 21, rename C\_MODE to DMG\_C\_MODE as specified below*

If the FORMAT parameter of the TXVECTOR is NON\_EDMG, then the modulation is defined by the NON\_EDMG\_MODULATION parameter. If the NON\_EDMG\_MODULATION parameter is equal to DMG\_C\_MODE or NON\_EDMG\_DUP\_C\_MODE, then the TXTIME parameter shall be defined in microseconds (µs) as follows:

**CID 3062**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Clause Number(C)** | | **Page(C)** | | **Line(C)** | | **Comment** | **Proposed Change** | | |
| 29.3.3.3.2.3 | 376 | | 32 | | In other parts of 802.11-2016 standard and this amendment, 7/8 refers to a code rate R, upon which LDPC is dependent (see e.g. section 20.6.3.2.3.3 or 29.5.9.4.3). Isn't it the same thing here? | | | Change "LDPC rate" to "code rate" or "LDPC code rate" |

*Resolution:*

Revised.

*Editor: p 376, line 30, change "LDPC rate" to "LDPC code rate” as shown below*

* The Superimposed Code Applied field shall have the same value for all EDMG PPDUs comprising the EDMG A-PPDU. The receiver shall ignore the Superimposed Code Applied field if the the EDMG-MCS field does not indicate the LDPC code rate-7/8.

*Editor: p 408, line 17, change "LDPC rate" to "LDPC code rate” as shown below*

If a control trailer is present in a transmitted PPDU (see 29.3.7), the control trailer has a length of 18 data octets. The control trailer continues scrambling of the Data field with no seed reset as defined in 20.4.3.3.2. The control trailer is encoded using the rate 3/4 LDPC parity check matrix defined in 20.3.8.4 with shortening to achieve the effective LDPC code rate of 6/13.

**CID 3064**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Clause Number(C)** | | **Page(C)** | | **Line(C)** | | **Comment** | **Proposed Change** | | |
| 29.5.9.4.3 | 440 | | 16 | | It's not clear what the code rate R should be for example a) listed here. In b.b)-k) there are explicit code rates listed, and they're computed L\_CW\*R, here R is implicit? | | | Add a code rate R to example b)a. or rewrite all of b) in a different structure. |

*Resolution:*

Revised.

*Editor: p 440, line 15, add the list of LDPC code rates used in the case b).a) as below*

1. Convert the scrambled PSDU bits to LDPC codewords as follows:
   1. If ρ = 1 and LCW = 672 or 1344, R = ½, 5/8, ¾, 13/16, or 7/8:
      1. The output stream of scrambler is broken into the blocks of length LCWD = LCW×R bits such that the mth data word is 
      2. To each data word, parity bits , LCWP = LCW - LCWD, are added to create the codeword  such that 

*Editor: p 495, line 7, add the list of LDPC code rates used in the case b).a) as below*

1. Convert the scrambled PSDU bits to LDPC codewords as follows:

* If LCW = 672 or 1344, R = ½, 5/8, ¾, 13/16, or 7/8:
* The output stream of scrambler is broken into the blocks of length LCWD = LCW×R bits such that the mth data word is 
* To each data word, parity bits , LCWP = LCW – LCWD, are added to create the codeword  such that 

**CID 3065**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Clause Number(C)** | | **Page(C)** | | **Line(C)** | | **Comment** | **Proposed Change** | | |
| 29.5.9.4.3 | 440 | | 15 | | I would write this entire section differently. Among subpoints a-k under subheading b, item b) a. is a general algorithm but for specified values of L\_CW and and rho. Why not instead make a table of rho, L\_CW and R, and give the general formula in b)a. , rather than repeating the same thing for different constants 10 times? | | | Make a text such as: "The scrambled PSDU values are converted to LDPC codewords using the following strategcy, where starting values are listed in Table XX:  ...."  Then remove b)b.-k. (on page 440, line 23 - page 443, line 31) |

*Resolution:*

Rejected.

*Discussion:*

Potentially the section can be rewritten in the proposed way with general description of the encoding procedure. However, anyway the encoding needs to be described separately for ρ = 1 and ρ = 2. It creates two subcases. In the first case the shortened bits are discarded and in the second case they are replaced by the scrambled systematic bits.

Two general descriptions and two tables with parameters are needed. The table size should be 8 x 7, i.e. total number of LDPC CW lengths by the total number of code rates (all possible cases). Each table entry will contain the number of shortened bits, the number of punctured bits, and the H matrix LDPC code rate.

Then people will request examples for each case to get confirmation that they understand the general procedure correctly. We need examples at least for “no shortening and no puncturing case”, “shortening and no puncturing case”, “no shortening and puncturing case”, and “shortening and puncturing case”.

Finally, the number of rows for the entire procedure description will not be reduced.

**SP:**

Do you agree to accept comment resolutions for the CIDs 3311, 3382, 3312, 3313, 3314, 3315, 3316, 3331, 3332, 3333, 3334, 3375, 3376, 3596, 3622, 3704, 3377, 3623, 3705, 3201, 3378, 3624, 3706, 3202, 3625, 3301, 3732, 3175, 3720, 3721, 3724, 3212, 3213, 3178, 3179, 3725, 3214, 3730, 3722, 3602, 3381, 3380, 3268, 3177, 3180, 3181, 3172, 3173, 3174, 3183, 3090, 3091, 3166, 3740, 3086, 3092, 3093, 3088, 3087, 3089, 3130, 3120, 3121, 3122, 3123, 3062, 3064, 3065 proposed in (11-18-1678-01-00ay CID Resolution - Part XI) into the spec draft, [1]?

**References:**

1. Draft P802.11ay\_D2.0