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| 6.5.6.3 Encoding |
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Abstract

This document proposes specification text for subclause 6.5.6.3 of the SFD describing encoding process for EDMG SC PHY PSDU, [1].

**6.5.6.3 Encoding**

**6.5.6.3.1 General**

An EDMG SC PHY PSDU is encoded by a systematic LDPC block code as defined in 20.6.3.2.3.1. The EDMG encoding supports two types of block size equal to 672 bits (short codeword) and 1344 bits (long codeword). The set of code rates is defined in Table 1. The parity check matrices are defined in 6.5.6.3.2. The encoding process for SISO transmissions is defined in 6.5.6.3.3. The encoding process for MIMO transmissions is defined in 6.5.6.3.4.

Table 1: EDMG LDPC code rates.

|  |  |  |
| --- | --- | --- |
| **Code rate** | **Codeword size** | **Number of data bits** |
| **Short** | **Long** | **Short** | **Long** |
| ½ | 672 | 1344 | 336 | 672 |
| 5/8 | 672 | 1344 | 420 | 840 |
| ¾ | 672 | 1344 | 504 | 1008 |
| 13/16 | 672 | 1344 | 546 | 1092 |
| 7/8 | 672 | 1344 | 588 | 1176 |

**6.5.6.3.2 Parity check matrices**

See 6.3.6.

**6.5.6.3.3 LDPC encoding for SISO transmissions**

This subcaluse defines a SC PHY PSDU encoding process for SISO transmissions. The EDMG encoding process includes the following steps:

1. Steps a) – c) as defined in subclause 20.6.3.2.3.3 for DMG encoding, assuming that *LCW* can be equal to 672 or 1344 bits and *LCW* = 672, *R* = 7/8 code shall use b.1) encoding procedure.
2. The number of SC symbol blocks, *NBLKS*, and the number of symbol block padding bits, *NBLK\_PAD*, are calculated as follows:





where *NCBPB* is the number of coded bits per block transmitted over the 2.16 GHz channel and *NCB* defines the number of 2.16 GHz channels, NCB (1 ≤ NCB ≤ 4), that make up the signal bandwidth of an EDMG PPDU. The values of NCBPB for different types of GI are provided in Table 2.

The coded bit stream is concatenated with *NBLK\_PAD* zeros. They are scrambled using the continuation of the scrambler sequence that scrambled the PSDU input bits.

Table 2: Values of NCBPB for different types of GI.

|  |  |  |  |
| --- | --- | --- | --- |
| **Symbol mapping** | **Short GI** | **Normal GI** | **Long GI** |
| π/2-BPSK | 480 | 448 | 384 |
| π/2-QPSK | 960 | 896 | 768 |
| π/2-16QAM | 1920 | 1792 | 1536 |
| π/2-64QAM | 2880 | 2688 | 2304 |

In case of 2.16 + 2.16 GHz channel aggregation, the first NCBPB bits are assigned to the primary channel transmission and the second NCBPB bits are assigned to the secondary channel transmission. The procedure is repeated for the following 2\*NCBPB bits.

In case of 4.32 + 4.32 GHz channel aggregation, the first 2\*NCBPB bits are assigned to the primary channel transmission and the second 2\*NCBPB bits are assigned to the secondary channel transmission. The procedure is repeated for the following 4\*NCBPB bits.

**6.5.6.3.4 LDPC encoding for MIMO transmissions**

**References:**

1. 11-15-1358-09-00ay-11ay Spec Framework