Project: IEEE P802.15 Working Group for Wireless Personal Area Networks (WPANs)

Submission Title: [Resolution for Comment ID614 in LB43]
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Re: [In response to IEEE802.15-08-0432-05-003c-lb43-comments]

Abstract: [This document provides a suggested resolution for comment ID614 in IEEE802.15-08-0432-05-lb43-comments]

Purpose: [To assist in comment resolution for LB43]

Suggested Resolution for Comment ID614

CID	Subclause	Page	Line	Comment	SuggestedRemedy	Response
614	12.2.2.2.3	73	35-54	The rate=14/15 LDPC code does not appear to perform very well.	Consider a new code for this rate or elimination of this rate.	Reject: The rate-14/15 LDPC code performs well at the given code rate, as can be seen in the performance of mode 2.2.1 in the document 07/693/r3 and the analysis in the document 08/658/r0. The high code rate of 0.933 will be useful for 15.3c because that enables to transmit 3Gbps 1080p uncompressed video stream using a simple modulation of QPSK with single carrier.

Analysis of Code Efficiency

Gap between E_b/N_0 required for bit-error rate (BER) of 10^{-6} and the Shannon limit in AWGN channel for all codes employed in 15.3c draft D00

rate	code	E_b/N_0 for BER=10^{-6} (dB)	Shannon limit (dB)	gap (dB)
0.333	Convolutional (K=7)	4.48	–0.5	–4.98
0.5	LDPC(672, 336)	2.94	0.19	–2.75
0.666	Convolutional (K=7)	5.18	1.06	–4.12
0.75	LDPC(672, 504)	4.04	1.63	–2.41
0.875	LDPC(672, 588)	5.21	2.84	–2.37
0.933	LDPC(1440, 1344)	5.72	3.80	–1.92
0.937	RS(255, 239)	7.08	3.88	–3.20
0.964	RS(224, 216)	7.79	4.62	–3.17

Note that the rate-14/15 LDPC code shows the best performance at the given code rate in the all codes for 15.3c.