

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

Submission Title: Channel Code Consideration for UWB PHY

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Re: Contribution to IEEE 802.15.6 UWB group, May 2010

Abstract: To be considered in IEEE 802.15.6 UWB group

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Purpose

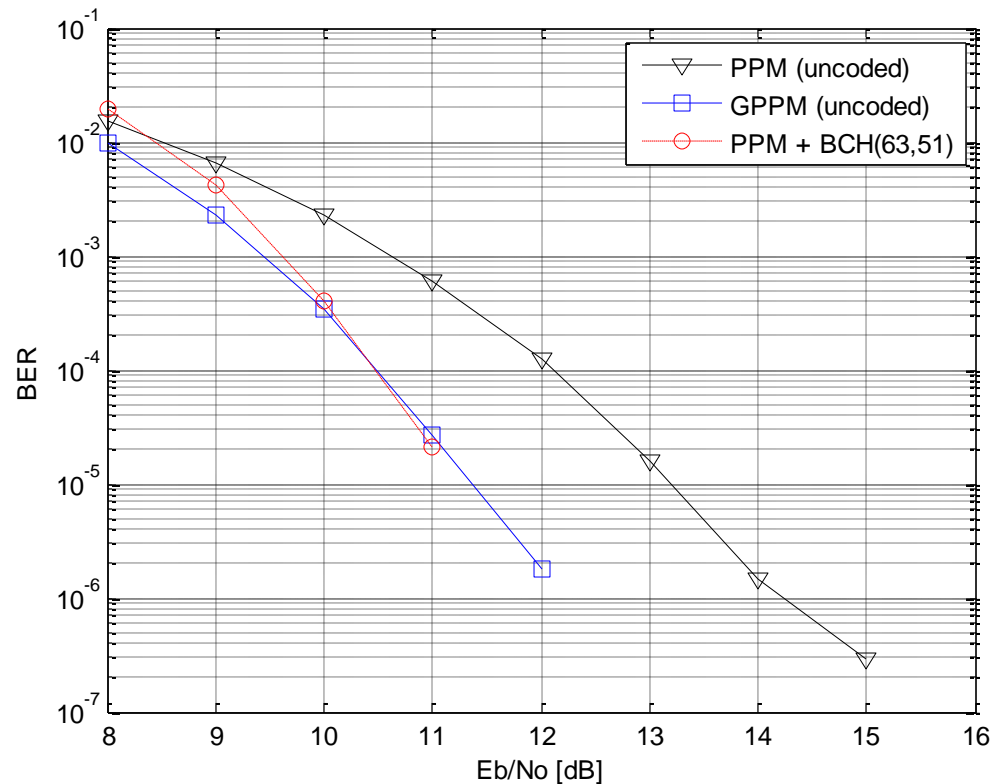
- Is BCH channel code suitable for UWB PHY?

Performance Comparison

- Simulation Environments
 - UWB signal: Chirp signal in NICT proposal
 - Symbol Rate: 0.9765Msps
 - $T_w = 32\text{nsec}$
 - Channel: AWGN
 - Considered systems
 - 1. PPM
 - 2. On-off signaling with waveform coding (GPPM)
 - 3. PPM + BCH(63,51)
 - Note that PPM and GPPM has the same bit-rate.

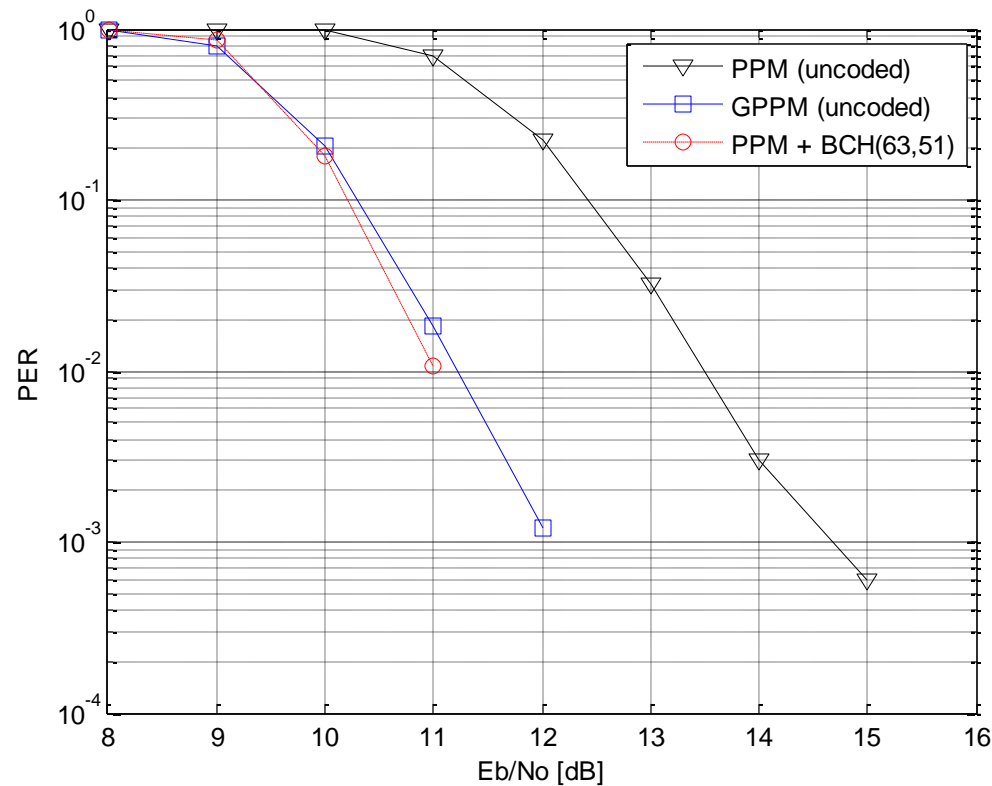
Performance Comparison

- BER v.s. E_b/N_0



Performance Comparison

- PER v.s. E_b/N_0



Performance Comparison

- The performance of BCH(63,51) is similar with GPPM

Suggestion

- Random error correction is enough with GPPM.
- The outer code should be some channel codes that are robust to burst error. In that sense, RS code verified by 15.4a can be considered.