

Performance Analysis Of Bit-Interleaved Space-Time (BI-ST) Coded Systems Over Wireless Channels

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Summary

In this paper a union bound on the bit error probability of bit-interleaved space-time (BI-ST) coded systems is derived. The derivation is based on the uniform interleaving assumption of the coded sequence prior to transmission over the multiple antennas. The performance of a BI-ST coded system is a function of how the bit errors are distributed over the signals in the codeword. In this paper, we derive this distribution as well as the corresponding pairwise error probability. The bound is a function of the distance spectrum of the code, the signal constellation used and the space-time (ST) encoding scheme. The bound is derived for a general BI-ST coded system and applied to two specific examples; namely, the BI space-time coded modulation (BI-STCM) and the BI space-time block codes (BI-STBC). Results show that the analysis provides a close approximation to the performance for a wide range of signal-to-noise ratios (SNR).

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