Comparison of Precoding Methods for Broadband MIMO Systems

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Abstract

In this paper we investigate non-linear precoding solutions for the problem of broadband multiple-input multiple-output (MIMO) systems. Based on a broadband singular value decomposition (BSVD) we can decouple a broadband MIMO channel into independent dispersive spectrally majorised single-input single-output (SISO) subchannels. Bit loading is proposed to optimally utilise these SISO subchannels after mitigating their individual inter-symbol-interference (ISI) using Tomlinson-Harashima precoding (THP). This method is benchmarked against recent results of both MMSE linear and THP designed for frequency-selective MIMO channels. Simulation results show that better bit-error-ratio (BER) can be achieved especially for higher throughput targets when compared to the benchmark.

3rd IEEE International Workshop on Computational Advances in Multi-Sensor Adaptive Processing, CAMPSAP 2009 - 2009, December