

Introduction of Dual Regularization Parameters to Improve the Performance of MMSE Based Vector Perturbation

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Abstract— This paper proposes a method to improve the performance of minimum-mean square error (MMSE) based vector perturbation (MMSE-VP) by introducing dual regularization parameters of MMSE precoding matrix. First regularization parameter is set so as to maximize the signal to interference plus noise ratio (SINR) value of each stream to find the optimal perturbation vector. The second regularization parameter is set as to minimize the total MSE between the transmitted perturbation vector and received perturbation vector to pre-cancel the interference among the streams. The simulated results confirm that the proposed method can improve the performance of MMSE-VP over *i.i.d.* MIMO channel and indoor correlated frequency-selective fading MIMO channel.

Keyword— MMSE, vector perturbation, regularization parameters, performance optimization



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