

# On the Achievable Performance of Nonlinear MIMO Systems

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*Abstract*—Pre-processing techniques employed at the transmitter side of multiple-input, multiple-output (MIMO) systems, such as the ones used by MIMO singular value decomposition (SVD) (MIMO-SVD) techniques, can lead to signals with large envelope fluctuations and high peak-to-average power ratio (PAPR). For this reason, we can have amplification difficulties and increased sensitivity to nonlinear distortion effects. In this work, we consider MIMO-SVD schemes with strong nonlinear distortion effects. It is shown that contrarily to what one could expect, the asymptotic optimum performance of the MIMO system with strong nonlinear distortion effects can be much better than the optimum performance with an ideal, linear transmitter. <sup>1</sup>

*Index Terms*—MIMO, nonlinear distortion effects, optimum detection, performance evaluation, SVD.

