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**Abstract**

Wireless communication systems are being designed to integrate features that include high data rates as well as high quality of service in the existing communication framework. For this an orthogonal space-time block code (OSTBC) technique improves error performance of synchronous data links without sacrificing data rate or requiring more bandwidth. Trellis coded

modulation (TCM) enables efficient transmission scheme and to achieve high coding gain by integrating coding and modulation. In this work an OSTBC concatenated with TCM is implemented for information transmission over different antenna configurations, from Single-Input Single-Output (SISO) to Multi-Input Multi-Output (MIMO) channels. The channel used is a quasi-static Rayleigh fading channel with additive white Gaussian noise (AWGN). The proposed model takes the advantages of the concatenation scheme: the spatial diversity gain offered by OSTBC and the coding gain offered by TCM. Using MATLAB Simulink the system performance is compared with using only TCM or OSTBC and TCM concatenated with OSTBC. Significant performance improvement of the system is achieved using this scheme. The proposed scheme achieved full transmits diversity and coding gain of more than 2dB without using interleavers/deinterleavers. It is observed that performance of MIMO system is better than SISO or MISO (Multi-Input Single-Output) system.

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## Index Terms

Wireless

Computer Science

Communications

## Key words

OSTBC

TCM

MIMO

SISO

AWGN

Interleaver

Concatenation

