

Alamouti Distributed Space-Time Coding with Relay Selection

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Abstract—This paper examines the impact of relay selection on the performance of Alamouti distributed orthogonal space-time block coding (AI-DSTC) in a two-relay network. The SNR maximizing is implemented at the receiver based on selecting the relay to cooperate or not. The receiver can always find the optimal selected relay by exhaustive search where the number of relays is only two. It is shown in this work that the proposed scheme obtains full diversity order and provides an additional array gain compared to conventional AI-DSTC. The proposed scheme has a lower bit error rate if compared to the beamforming when the transmit power is high. Our results show that the proposed scheme is more power efficient than the conventional AI-DSTC and cooperative beamforming. Also, the proposed scheme increase life time of the relay since 50% of the time the relay is off.

Keyword—Relay Selection, Alamouti distributed orthogonal space-time block coding, Amplify-and-Forward, Wireless relay networks.

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