

Reliability Performance Evaluation of Distributed Alamouti-based Schemes

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Abstract:

This paper analyzes the BLER performance provided by a virtual MIMO (VMIMO) scheme which implements a modified Alamouti SFBC encoding-decoding algorithm by using selective relaying of two fixed Decode&Forward Relays (RN) and single-antenna devices. The paper also analyzes the BLER performance provided by the classical relay-based distributed Alamouti scheme with single-antenna devices and, as baseline, by the non-cooperative Alamouti scheme which uses an antenna array at the base station (BS). We present the theoretical derivations of the BLER provided by the three schemes vs. the SNRs of the employed channels, using an approximation of the post-decoding BLER ensured by the FEC-code used on each constituent link, and validate them by computer simulation, both for the DL and UL transmissions of a cellular network, over Rayleigh block-faded channels, for various positions of the user terminal (UT) vs. the BS and RNs.