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## Abstract

A new Multiple-Input Single-Output Powerline Communications (MISO PLC) transmission scheme is proposed as an extension to the conventional Single-Input Single-Output (SISO) PLC transmission scheme to achieve high data rate with diversity. This scheme is called Enhanced-PLC scheme (EPLC). A Space-Time (ST) coding is employed at the transmitter terminal. In addition, a modified Maximum-Likelihood (ML) decoder is proposed at the receiver over a quasi-static flat fading channel. The derivations of Signal-to- Noise Ratio (SNR), Symbol Error Rate (SER), outage probability, and spectral efficiency are conducted for the proposed PLC transmission scheme and compared to the conventional SISO and the 2X1 MISO ST-coded PLC schemes. The analytical results show that the proposed MISO PLC transmission scheme outperforms the SISO and the 2X1 MISO schemes in terms of error rate, outage probability, and rate performances.

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### Index Terms

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## **Keywords**

PLC, EPLC, In-home PLC Network, SISO, MISO, ST-Coding, ML Decoder