# Markov Characteristics of the Power Line Communication Channels in China

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**Abstract :** Due to the multipath and pulse noise nature, power line communications(PLC) channel can be modelled as a memory one with the finite states Markov model(FSMC). As the most important parameter modelling a Markov channel,the memory order in an FSMC is not solved in PLC systems yet. In the paper, the mutual information is used as a measure of the dependence between the different symbols, treated as the received SNA or amplitude of the current channel symbol or that of previous symbols. The joint distribution probabilities of the envelopes in PLC systems are computed based on the multi-path channel model, which is commonly used in PLC. we confirm that given the information of the symbol immediately preceding the current one, any other previous symbol is independent of the current one in PLC systems, which means the PLC channels is a Markov chain with the first-order. The field test is also performed to model the received OFDM signals with the help of AR model. The results show that the first-order AR model is enough to model the fading channel in PLC systems, which means the amount of uncertainty remaining in the current symbol should be negligible, given the information corresponding to the immediately preceding one.

**Keywords :** power line communication, channel model, markovian, information theory, first-order
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