

Performance Improvement of OFDM-based AF Relay Systems through Subcarrier Mapping

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Abstract:

OFDM-based relay systems have shown that can fulfill the expectations on performances and coverage extension put in front of future wireless cellular systems, and thus they have become a part of both accepted solutions for IMT-Advanced systems. Using channel state information (CSI) on source-relay and relay-destination links, further performance improvement in dual-hop OFDM-based relay systems may be attained through ordered subcarrier mapping (SCM) performed at the relay station (R). We analytically examine the level of performance improvement, in terms of bit error rate (BER), accomplished through SCM in dual-hop OFDM fixed gain (FG) amplify-and-forward (AF) relay system. A scenario without direct communication between the source of information and destination terminal, and with Rayleigh fading statistics on both hops is assumed. Moreover, we compare the energy balance of this solution, with the OFDM AF FG relay system without SCM, as well as with the case of direct transmission.