

In this paper, we re-examine the relay channel under the decode-forward (DF) strategy. Contrary to the established belief that block Markov coding is always the rate-optimal DF strategy, under certain channel conditions (a link regime), independent signaling between the source and relay achieves the same transmission rate without requiring coherent channel phase information. Furthermore, this independent signaling regime allows the relay to conserve power. As such, we design a composite DF relaying strategy that achieves the same rate as block Markov DF but with less required relay power. The finding is attractive from the link adaptation perspective to adapt relay coding and relay power according to the link state. We examine this link adaptation in fading under both perfect channel state information (CSI) and practical CSI in which nodes have perfect receive and long-term transmit CSI, and derive the corresponding relay power savings in both cases. We also derive the outage probability of the composite relaying scheme, which adapts the signaling to the link regime. Through simulation, we expose a tradeoff for relay placement showing that the relay conserves the most power when closer to the destination but achieves the most rate gain when closer to the source.