Preface

Relaying techniques, in which a source node communicates to a destination node with the help of a relay, have been proposed as a cost-effective solution to address the increasing demand for high data rates and reliable services over the air. As such, it is crucial to design relay systems that are able to not only provide high spectral efficiency, but also fully exploit the diversity of the relay channel. With this objective in mind, this brief aims to report on recent advances on achievable rates, power allocation schemes, and error performance for half-duplex (HD) and full-duplex (FD) amplify-and-forward (AF) single-relay systems. First, assuming the relay operates in HD mode, we discuss the capacity and respective optimal power allocation for a wide range of AF protocols over static and fading channels. Then, optimal amplification coefficients in terms of achievable rate are presented. Turning our attention to the performance with finite constellations, the error and diversity performance of AF systems are also discussed. Finally, the capacity and error performance analysis is extended to the FD relay mode of operation, where the residual self-interference due to FD transmission is explicitly taken into account.

The target audience of this Springer Brief is researchers and professionals working on current and next-generation wireless systems. The content is also valuable for advanced students interested in wireless communications and signal processing for communications.

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