Outage Performance of Multi-Antenna Cooperative Incremental Relaying Systems in the absence of Direct Link

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Abstract—Motivated by recent works involving multi-antenna fixed relay cooperation, this paper investigates the performance of fixed multi-antenna relay networks, where the source node communicates with the destination node via two fixed multi-antenna relays (infrastructure based relays). To improve the system spectral efficiency, incremental relaying technique is applied. The exact closed-form expression for the end-to-end system outage probability has been derived. It is numerically demonstrated that the system performance will achieve the best performance when one relay locates near the central point of the link from source to destination while the other locates near the destination. A performance comparison between the proposed system and the conventional system using fixed three transmission time slots is also represented and it is concluded that the proposed system outperforms the other in terms of spectral efficiency.

Index Terms—adaptive decode-and-forward, Rayleigh fading, outage probability, multi-hop communication, incremental relaying, fixed relay, multi-antenna relay.