

The cooperative communication in wireless multi-hop networks is a reliable energy efficient mechanism that mitigates the effects of channel fading and improves the performance and throughput of the systems. In this report, green cooperative multi-hop scheme is proposed by employing signal space diversity (SSD). The proposed scheme offers a significant improvement in performance of the regenerative multi-hop networks without the requirement of extra bandwidth or power. The expressions for the average end to end bit error probability of the multi-hop networks employing the SSD scheme is derived. The optimal relay location for a better performance and the total energy consumption of the scheme is also probed. The simulation results show that the proposed scheme provides better quality of service and is more energy efficient compared to the conventional decode and forward scheme in single-hop as well as multi-hop situations.

Further space-time Alamouti code is also presented with signal space diversity for multi-hop cooperative wireless communication systems. Using two transmit antennas, constellation rotation and interleaving at the source, the signal is forwarded to the destination node via relay link(s). The simulation results show an improved performance of the end to end average bit error rate