

This work proposes adaptive buffer-aided distributed space-time coding schemes and algorithms with feedback for wireless networks equipped with buffer-aided relays. The proposed schemes employ a maximum likelihood receiver at the destination, and adjustable codes subject to a power constraint with an amplify-and-forward cooperative strategy at the relays. The adjustable codes are part of the proposed space-time coding schemes and the codes are sent back to relays after being updated at the destination via feedback channels. Each relay is equipped with a buffer and is capable of storing blocks of received symbols and forwarding the data to the destination if selected. Different antenna configurations and wireless channels, such as static block fading channels, are considered. The effects of using buffer-aided relays to improve the bit error rate (BER) performance are also studied. Adjustable relay selection and optimization algorithms that exploit the extra degrees of freedom of relays equipped with buffers are developed to improve the BER performance. We also analyze the pairwise error probability and diversity of the system when using the proposed schemes and algorithms in a cooperative network. Simulation results show that the proposed schemes and algorithms obtain performance gains over previously reported techniques.