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**Title:** RIS-Assisted Coded Cooperation Wireless Communications Based on Polar / LDPC Codes with Finite Code Length

**Abstract:**

Recently, owing to the merits of low cost, low power consumption, intelligent reconfigurability and convenient deployment, reconfigurable intelligent surface (RIS) is recognized to have vast prospect in the sixth generation (6G) wireless communications. Coded relay cooperation technology can form a virtual multiple input multiple output (MIMO) for the devices with single antennas, which enables them to enjoy the spatial diversity and coding gain. Although RIS and relay share some similarities in common, they have fundamental differences and can indeed complement each other. In this talk, we propose a novel RIS-assisted coded cooperation system based on polar / LDPC codes to pursue the ultra-reliable and global coverage transmission. Firstly, we establish the RIS-assisted coded cooperation system based on polar / LDPC codes. The codes employed at the source and relay are jointly designed, and the joint decoding is performed at the destination. Subsequently, we further analyze their performance when finite code length is considered in practical scenarios. We derive the theoretical expressions for outage probability and ergodic capacity (EC). And the closed-form expression for EC with finite code length is obtained by approximating its tight upper and lower bounds. Finally, theoretical analysis and simulation results demonstrate the superiorities of the proposed systems compared with the existing benchmark schemes.