(Pt24)Performance Enhancement for Harvest-to-Transmit
Cognitive Multi-hop Networks with Best Path Selection Method under Presence of Eavesdropper

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(Pt9)*Abstract*—**This paper proposes a path-selection protocol to enhance outage performance for harvest-to-transmit (HT) multi-hop cooperative cognitive radio networks. In the proposed protocol, one of available paths between a secondary source and a secondary destination is chosen to send the source data to the destination. The source and relays on the selected path must harvest energy from the radio frequency (RF) signals of ambient beacons for the data transmission. Under the presence of a primary user (PU) and a secondary eavesdropper (E), these transmitting nodes also have to adjust their transmit power to satisfy an interference constraint given by PU as well as to against eavesdropping attacks from E. For performance evaluation, we derive exact and asymptotic closed-form expressions of end-to-end outage probability (OP) for the proposed scheme over Rayleigh fading channel. Monte Carlo simulations are then performed to validate the theoretical derivations.**

(Pt9)*Keyword*—. **Physical-layer security, underlay cognitive radio, energy harvesting, multi-hop transmission, path selection, outage probability.**

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