

# Fast Power Allocation for Secure Communication with Full-Duplex Radio

Abstract:

This paper considers a method for improving physical layer security of wireless networks with full duplex radio. In particular, fast algorithms are developed to compute power allocations in subcarriers, subject to power and rate constraints, to maximize the secrecy capacity of a three-node network consisting of a source, a full duplex destination and an eavesdropper. A residual level of radio self interference channel is considered. The optimal power allocation at the destination is found to be significant especially when its power budget is high.

Also studied in this paper are a network with multiple full duplex destinations and another network with multiple sources. Using the algorithms developed in this paper, we are able to show that a multi user strategy that optimizes the power distributions among the users in terms of either the sources or the destinations can yield a substantial gain of secrecy capacity over a single user strategy.