

In-Band Full-Duplex Wireless Powered Communication Networks

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Abstract—In this paper, we consider wireless powered communication network (WPCN) in which a hybrid access point (H-AP) and user equipments (UEs) all operate in in-band full duplex (IFD) mode. FD ability of UE allows it to harvest energy from the received energy while it transmits information in uplink (UL) at the same time, as well as that of the H-AP allows it to broadcast energy in the downlink (DL) while it receives UEs' UL information. In the aforementioned network, we derived optimal UL time allocation to users to maximize the sum-throughput in the network. We show by simulation that the IFD WPCN has higher throughput than that of HD WPCN when the selfinterference (SI) can be effectively cancelled thanks to more efficient use of UL time and increased harvested energy.

Keyword—In-band full duplex, wireless power transfer, resource allocation



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