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1. Introduction

1.1. Motivation

The spectrum scarcity is a major issue in the wireless communication domain. The spectrum utilization efficiency improves with help of cognitive radio technology that can change some parameters based on the network environment and allow the unlicensed secondary user (SU) to share the frequency band allotted to licensed primary user (PU) (Mitola and Maguire 1999). Another constraint in wireless system is the power scarcity. Radio frequency (RF) energy harvesting is a promising solution to supply power in wireless system especially in infrastructureless system (Mishra et al. 2013, 2014). In Mishra et al. (2013), the authors have proposed an RF energy harvesting based dual hop model and analysed the performance of wireless energy harvesting and communication predicting using energy forward (EF) relay mode. In Lyman and Koo (2016), the authors have considered a relay access strategy to maximize throughput of cognitive radio network (CRN) where SU harvest energy from PU as well as ambient sources such as solar, wind, etc. Banerjee and Banerjee (2019), Liu et al. (2016), the authors have focused on the energy harvesting from multiple PU signals. In Liu et al. (2016), the authors have derived the closed form expression of secondary throughput