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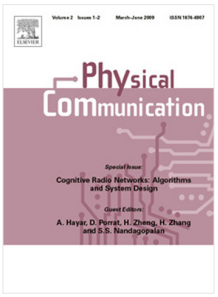

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A Novel Energy-Balanced Routing Algorithm in Energy Harvesting Sensor Networks

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Abstract

In energy harvesting wireless sensor networks, despite the network lifetime can be prolonged through node's energy collection, how to enhance energy efficiency and optimize routing protocol are still critical and challenging due to volatility and uncertainty of energy harvesting. In this paper, we propose a novel routing method in energy harvesting sensor networks by taking into account the outage probability of relay transmission and node's residual energy. Our goal is to achieve a balanced-based routing algorithm with improved transmission performance. We design an optimal power control strategy to optimize the outage probability for bidirectional sub-channels in energy harvesting sensor networks. Then, we raise a rational objective function to address the concerns of high efficient and balanced energy consumption in searching router. The main routine of the proposed routing algorithm is also given. Numerical results are provided to testify the performances of our proposed method from the perspectives of network lifetime and outage probability.

Keywords: