[2010-0088]基于协作MIMO的多跳WSN动态分簇选择算法研究

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摘要
为解决基于协作MIMO的同构WSN能量节省与能耗均衡问题，建立了多跳分布式WSN系统模型. 对协作MIMO通信中的簇间长传输距离与簇内短传输距离进行了分析，找到与传统SISO传输相比较节省能量的距离门限. 根据分析提出了一种新的基于剩余能量与距离门限的动态分簇(DCREDT)选择算法，在节省能量的前提下使剩余能量较大的节点优先成为簇首，实现了簇首与其它节点之间的能耗均衡. 最后分析了采用DCREDT选择算法进行多跳传输的总能耗，并仿真验证了该算法的合理性与有效性.
关键词　无线传感器网络, 协作MIMO, DCREDT选择算法, 能耗均衡
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Research on Dynamic Clustering Selection Algorithm of Multi-hop WSN Based on Cooperative MIMO

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Abstract
In order to solve the problem of energy saving and energy consumption balance in homogeneous WSN based on cooperative MIMO, a multi-hop distributed WSN system model was built. The inter-cluster long transmission distance and intra-cluster short transmission distance in cooperative MIMO communication were analyzed, and the distance thresholds were found, with which more energy could be saved in communications than that in traditional SISO communications without the distance thresholds condition. After that, a novel dynamic clustering selection algorithm based on remained energy and distance thresholds (DCREDT) was proposed based on our analysis. Under the premise of saving energy, the nodes having more remained energy would become cluster heads preferentially, so that energy consumption balances between cluster heads and other nodes were realized. Finally, by use of DCREDT selection algorithm, the total energy consumptions in multi-hop transmissions were analyzed. The reasonableness and validity of this algorithm were verified by simulations.
Key words　Wireless sensor networks　cooperative MIMO　DCREDT selection algorithm　energy consumption balance

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