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论文

Two-way中继系统协作节点选择及功率分配策略

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Cooperative Node Selection and Power Allocation Strategy in Two-way Relay System

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摘要 为了提高Two-way中继系统总速率，该文提出了一种Two-way AF中继系统的双向中继选择(BRS)策略，该策略通过联合考虑中继节点处的接收信噪比和中继节点到目的节点间的信道增益，实现了最优中继选择。进一步，在最优中继基础上提出了Two-way中继系统两种优化功率分配策略：(1)基于凸优化的功率分配策略(OPA-CO)；(2)基于信道增益差异的优化功率分配策略(OPA-DCG)。方案(1)提出了总功率受限的条件下最大化Two-way中继系统总速率的优化模型；方案(2)通过考虑链路之间信道增益的不同，提出了一种速率增量最大化的数学优化模型，为降低求解凸优化模型的复杂度，采用一种迭代功率分配算法求解上述优化模型。仿真结果证明两种策略均能提高系统总速率。

关键词： 双向中继通信 中继选择 功率分配 放大转发

Abstract： In order to improve the sum-rate of Two-way relay system, this paper proposes a Bi-directional Relay Selection (BRS) scheme in Two-way AF relay system. This scheme selects the optimal relay through joint considering the receive SNR (Signal Noise Rate) at the relay node and the channel gain between relay and destination node; Furthermore, this paper proposes two optimal power allocation scheme in Two-way relay system: (1) Optimal Power Allocation scheme based on Convex Optimization (OPA-CO), (2) Optimal Power Allocation scheme based on the Differences of Channel Gains (OPA-DCG); Scheme (1) establishes the optimal issue that how to maximize the sum-rate of Two-way relay system when total power is limited; Scheme (2) establishes a mathematical optimal model that how to maximize the increment of sum-rate based on the differences of channels gains. This paper uses an iterative power allocation algorithm to solve the optimal model mentioned above for the purpose of reducing the complexity of solving convex optimal mode. Simulation result shows that all the schemes mentioned above can improve the sum-rate.

Keywords： Two-way relay communication Relay selection Power allocation Amplify-and-forward

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