Minimum-Energy Broadcasting and Multicasting in Ad Hoc Networks: Some Integer Programming Formulations and Computational Experiences

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Broadcast (multicast) routing in a wireless network involves the construction of a broadcast (multicast) tree used by a source node to send messages to some other nodes in the network. The energy consumption of the tree is the sum of the transmission power at the nodes. The optimization problem of finding a broadcast (multicast) tree of a minimum amount of energy arises in applications of wireless networking where network units must be energy-aware. An example of such wireless systems is ad hoc networks. In this talk we present some integer programming formulations for this problem and report our computational experiences.