



Topology Optimization Control with Balanced Energy and Load in Underwater Acoustic Sensor Networks

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Abstract- In view of unbalanced link bandwidth and node energy consumption in Underwater Acoustic Sensor Networks (UASNs), a distributed topology optimization control algorithm (EL-BatCA) is proposed, which is based on balanced network energy and load. A hierarchical network model is designed based on minimum-hop, by which the nodes are divided into n layers. EL-BatCA is implemented through three stages-topology graph formation in initialization, an innovative transmission power adjustment in topology control, and finally topology optimization through object functions. Simulation results show that EL-BatCA not only balances energy consumption and network load, but also prolongs network lifetime and improves network throughout.

Index terms: UASNs; Network Load; Node energy; Topology Optimization; Topology control, EL-BatCA