

# Multiple regression analysis of IEEE 802.16j relay network throughput

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**Abstract**—In IEEE 802.16j relay networks, time division multiple access (TDMA) is adopted for sharing wireless network resources while avoiding radio wave interference. Time slot assignment determines the degree of spatial reuse of wireless network resources and radio interference strength, which affects network performance. The relay network performance is also influenced by various factors, such as background noise level, path loss exponent, density of relay nodes, and transmission signal strength. In this paper, we present the results of multiple regression analysis of IEEE 802.16j relay network throughput. We first summarize the network environment parameters that affect the throughput of relay networks and conduct extensive simulation experiments with various sets of parameter values. From the simulation results, we investigate the relative effect of parameters on throughput performance by multiple regression analysis. The analysis results show that background noise level and path loss exponent are the key parameters for determining relay network throughput. We also obtain a regression equation to estimate the throughput with enough accuracy.

**Keyword**—IEEE 802.16j, time slot assignment, SINR, throughput, multiple regression analysis



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