

1106-05-1028

Daniela Ferrero* (dferrero@txstate.edu), 601 University Drive, Department of Mathematics, Texas State University, San Marcos, TX 78666. *On the power domination problem in graphs.*

Electric power companies need to monitor the state of their networks continually in order to prevent black-outs. One method to accomplish this task is to place Phase Measurement Units (PMUs) at selected network locations. The synchronized readings provided by these PMUs, in conjunction with Kirchoff's laws, permit to determine the state of the power network at any element of the network. Because of the high cost of a PMU, it is important to minimize the number of PMUs while maintaining the ability of monitoring the entire system. Since power networks can be modeled by graphs, this problem translates into a graph theory problem: the power domination problem. The power domination problem in graph theory is closely related the zero-forcing problem in algebraic graph theory and it is also related to some chip-firing games. In this talk we will survey known results and future challenges in the study of the power domination problem, especially in connection to other combinatorial and geometrical problems. (Received September 09, 2014)