1146-13-258 **Michael Cowen*** (mcowen@clemson.edu), **James Gossell**, **Alan Hahn**, **W. Frank Moore** and **Sean Sather-Wagstaff**. *Power edge ideals.*

Every electrical power system can be modeled by a graph G whose vertices represent buses and whose edges represent power lines. A *phasor measurement unit* (PMU) is a device that can be placed at a bus to observe the voltage at that bus as well as the current and its phase through all incident power lines. The problem of monitoring the entire electric power system using the fewest number of PMUs is closely related to the well-known vertex covering and dominating set problems in graph theory.

In this talk, we will give an overview of the PMU placement problem and its connections to commutative ring theory. We define the *power edge ideal* I_G^P of a graph G with n vertices in a polynomial ring $R = k[X_1, \ldots, X_n]$ and we describe some algebraic properties of the quotient R/I_G^P. In particular, we will show that, when we restrict to trees, the Cohen-Macaulay property is implied by the unmixed property and implies the complete intersection property. We will also give examples to show that for non-trees, these implications can fail. (Received January 24, 2019)