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James Edward Gossell*, 155 Anderson Hwy apt. 823, Clemson, SC 29631. *The Power Edge Ideal of a Finite Simple Graph*. Preliminary report.

Every electric power system can be modeled by a graph G whose vertices represent electrical buses and whose edges represent power lines. A *phasor measurement unit* (PMU) is a monitor 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 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. By defining the *power edge ideal* I_G^P of a graph G , we will show how to use graphs of electric power grids to generate polynomial rings with desired algebraic properties. In particular, we will classify the trees G for which I_G^P is Cohen-Macaulay and prove that every such ideal is also a complete intersection.

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