Meeting: 1004, Bowling Green, Kentucky, SS 11A, Special Session on Commutative Ring Theory

1004-13-75 **Mike Axtell** (axtellm@wabash.edu), Department of Mathematics and Comp. Science, Wabash College, Crawfordsville, IN 47933, **Jim Coykendall*** (jim.coykendall@ndsu.edu), Department of Mathematics, North Dakota State University, Fargo, ND 58105-5075, and **Joe Stickles** (js298@evansville.edu), Department of Mathematics, University of Evansville, Evansville, IN 47722. *Zero-Divisor Graphs of Polynomial and Power Series Rings.*

The zero-divisor graph of a commutative ring is defined by declaring the vertex set to be the (nonzero) zero-divisors and the edge set to be $\{(x, y)|xy = 0\}$. It is well known (by the work of D. F. Anderson and P. Livingston) that the zero-divisor graph $(\Gamma(R))$ of a commutative ring, R, is connected and that $\mathrm{diam}(\Gamma(R)) \leq 3$. We consider the zero-divisor graphs $\Gamma(R[x])$ and $\Gamma(R[[x]])$ and discuss the relationships between invariants of these graphs and invariants of $\Gamma(R)$. In particular we discuss the relationship between the girth and diameter of a zero-divisor graph and the zero-divisor of its polynomial and power series extensions. In the case where R is Noetherian and $\mathrm{diam}(\Gamma(R)) \leq 2$ a more or less complete classification is given. (Received January 17, 2005)