

1125-VA-1513 **Erik O. Hieta-aho*** (eh991112@ohio.edu) and **Sergio Lopez-Permouth**. *Recognizing arbitrary rational functions amongst power series*. Preliminary report.

The talk will begin by reviewing topics introduced in a 2009 JPAA paper by Hou, Lopez-Permouth, and Parra-Avila on the characterization of (formal) rational power series over a commutative ring and the periodicity of coefficients. The aim of that paper was to characterize periodic rings; a ring was said to be periodic if all power series representing rational functions with a co-monic denominator have an eventually periodic sequence of coefficients are periodic. While focusing on only such rational functions makes sense in the context of fields, there may be a loss of generality in doing so. For that reason, we are currently pursuing the study of analogous questions regarding arbitrary rational functions. Emphasis is placed on finite rings as regular polynomials for those rings are easy to characterize. Among other results, we present a couple of somewhat surprising twists on familiar constructions regarding the embedding of fields of rational functions in power series rings as well as a generalization of the Kronecker criterion of rationality for functions given by power series. (Received September 17, 2016)