1046-15-1342   **Elizabeth J Bodine*** (`ebodine@math.wsu.edu`), Department of Mathematics, Box 643113, Washington State University, Pullman, WA 99164-3113. *Spectrally arbitrary patterns over finite fields.*

A zero-nonzero pattern $\mathcal{A}$ is spectrally arbitrary over a finite field $\mathbb{F}_q$ provided that for each monic polynomial $r(x) \in \mathbb{F}_q[x]$, there exists a matrix A over $\mathbb{F}_q$ with zero-nonzero pattern $\mathcal{A}$ such that the characteristic polynomial $p_A(x) = r(x)$. In this talk, we will investigate several zero-nonzero patterns over finite fields and show over which finite fields these patterns are spectrally arbitrary. We will explore the relationship between the number of nonzero entries of the matrix and the size and characteristic of the finite field in order to develop some necessary conditions and sufficient conditions for a pattern to be spectrally arbitrary. (Received September 15, 2008)