1145-15-2036 **Jillian L Glassett*** (jillian.glassett@wsu.edu) and **Judith J McDonald**. *Spectrally arbitrary patterns over rings with unity.*

A zero-nonzero pattern $\mathcal{A}$ is a matrix with entries from the set $\{0, *\}$. A square pattern $\mathcal{A}$ is spectrally arbitrary over R, a commutative ring with unity, if for each n-th degree monic polynomial $f(x) \in R[x]$, there exists a matrix A over R with pattern $\mathcal{A}$ such that characteristic polynomial of A, $p_A(x)$, is $f(x)$. $\mathcal{A}$ is relaxed spectrally arbitrary over R if for each n-th degree monic polynomial $f(x) \in R[x]$, there exists a matrix A over R with either pattern $\mathcal{A}$ or a subpattern of $\mathcal{A}$ such that $p_A(x) = f(x)$. We evaluate how the structure of rings affects how we determine if a pattern is spectrally arbitrary. We consider whether a pattern that is spectrally arbitrary over R is spectrally arbitrary or relaxed spectrally arbitrary over another commutative ring S with unity. We establish that a pattern that is spectrally arbitrary over $\mathbb{Z}$ is relaxed spectrally arbitrary over $\mathbb{Z}_m$ for all $m \in \mathbb{Z}_+$ and spectrally arbitrary over $\mathbb{Q}$. Similarly, a pattern that is spectrally arbitrary over the p-adic integers is spectrally arbitrary over the p-adic numbers. (Received September 24, 2018)