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Full Elasticity of Semi-group Rings

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Abstract of Talk: In a commutative, cancellative, atomic monoid M, the elasticity of a non-unit x is defined to be $\rho(x) = L(x)/l(x)$, where $L(x)$ is the length of the longest factorization of x into irreducibles and $l(x)$ is the length of the shortest. We define $\mathcal{R}(M) = \{\, \rho(x) \mid x \in M^{\bullet} \,\}$, where $M^{\bullet}$ is the set of nonzero non-units of M, and the elasticity $\rho(M)$ of the integral domain as $\sup \mathcal{R}(M)$. We say that M has full elasticity if $\mathcal{R}(M) = [1, \rho(M)] \cap \mathbb{Q}$. This talk will examine sufficient conditions to show that a monoid M has full elasticity. In particular, for a certain class of submonoids, $K[x; S]$, of the multiplicative monoid of the polynomial ring $K[x]$, it can be shown to be fully elastic when K is a finite field.