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Scott T. Chapman* (scott.chapman@shsu.edu), Sam Houston State University, Department of Mathematics and Statistics, Box 2206, Huntsville, TX 77341, **Stephen McAdam**, The University of Texas at Austin, Department of Mathematics, and **George Schaeffer**, The University of California at Berkeley, Department of Mathematics. *Elastic properties of some semirings defined by positive systems.*

We consider two semirings motivated by the study of positive systems in control theory and consider their basic factorization properties. The first is the semiring $\mathbb{R}^+[X]$ of polynomials with nonnegative real coefficients. The second is a semiring of algebraic integers having the form $\mathbb{N}_0[\tau] = \{x + y\tau \mid \text{where } x, y \text{ are nonnegative integers}\}$ for an appropriately chosen real quadratic integer τ . In each case, we show that the semiring has full infinite elasticity and that the Δ -set is $\{1, 2, 3, \dots\}$. The proof in the latter case uses results of Hans Rademacher on the distribution of primes in quadratic extensions which may be of independent interest. (Received August 31, 2009)