

1012-16-82

Peter D. Goetz* (pgoetz@bucknell.edu). *Fat Point Modules over a Family of Generalized Laurent Polynomial Rings*. Preliminary report.

Recently a new construction of rings was introduced by Cassidy, Goetz and Shelton. Some of these rings, called generalized Laurent polynomial rings or GLPR's, are quadratic Artin-Schelter regular algebras of global dimension 4. We study a family of AS-regular GLPR's such that for each algebra C in the family: (1) the point scheme is finite, (2) the defining point scheme automorphism has finite order, and yet (3) the algebra is not finite over its center. We study the critical GK-dim 1 modules F over C , so called fat point modules which correspond to simple objects in $\text{Proj } C$. Our main result is the classification of all such fat point modules. Our classification bifurcates into two subclasses: the modules for which the center $Z(C)$ does or does not act trivially. We also consider the action of the shift functor s and prove: (1) if $Z(C)$ acts trivially on F then s has infinite order on F , and (2) if $Z(C)$ acts nontrivially on F then s has even order on F . The proofs of these facts use the noncommutative geometry of some cubic Artin-Schelter regular algebras of global dimension 3. Thus in some sense $\text{Proj } C$ is glued together out of Proj of these auxiliary algebras. (Received September 08, 2005)