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Primitive and Poisson spectra of twists of polynomial rings. (English) Zbl 0939.16018

Algebr. Represent. Theory 2, No. 3, 269-285 (1999).

In this paper families of flat deformations of polynomial algebras $S = \mathbb{C}[x_1, \dots, x_n]$ and of group algebras $\mathbb{C}[x_1^{\pm 1}, \dots, x_n^{\pm 1}]$ are studied. The non-commutative deformed algebras are obtained by twisting the commutative multiplication using an automorphism σ of \mathcal{P}^{n-1} , so that a Poisson bracket is induced on S . The focus of the paper examines when the primitive ideals of the deformed algebra are in bijection with the symplectic leaves associated with the Poisson structure on S . An answer is obtained (for “generic” σ) in the case where the symplectic leaves are algebraic varieties. The work is motivated in part by the description of the prime spectrum of the quantized function algebras $\mathcal{O}_q(G)$ (for G semisimple and q generic) obtained by *A. Joseph* [*J. Algebra* 169, No. 2, 441-511 (1994; [Zbl 0814.17013](#))], and so appropriately ends by applying the insights obtained to the prime spectrum of $\mathcal{O}_q(M_2(\mathbb{C}))$, the coordinate ring of quantum 2×2 matrices.

Reviewer: [K.A.Brown \(Glasgow\)](#)

MSC:

- [16S80](#) Deformations of associative rings
- [17B37](#) Quantum groups (quantized enveloping algebras) and related deformations
- [16W10](#) Rings with involution; Lie, Jordan and other nonassociative structures
- [16S36](#) Ordinary and skew polynomial rings and semigroup rings
- [14A22](#) Noncommutative algebraic geometry
- [14E07](#) Birational automorphisms, Cremona group and generalizations

Cited in **10** Documents

Keywords:

twisted homogeneous coordinate rings; Poisson manifolds; flat deformations; polynomial algebras; group algebras; Poisson brackets; primitive ideals; deformed algebras; symplectic leaves; prime spectra; quantized function algebras; coordinate rings; quantum 2×2 matrices

Full Text: [DOI](#)