

Schwarz, Gerald W.

Differential operators on quotients of simple groups. (English) Zbl 0835.14019
J. Algebra 169, No. 1, 248-273 (1994).

Let X be an affine complex algebraic variety, and let $\Delta(X)$ denote the (non-commutative) algebra of algebraic differential operators on X . Then $\Delta(X)$ has a filtration $\{\Delta^n(X)\}$ by order of differentiation, and the associated graded algebra $\text{gr}\Delta(X)$ is commutative. Let X be smooth and a G -variety (G is a reductive complex algebraic group). Let $\pi_X : X \rightarrow X/G$ be the quotient morphism. Then one has a natural map $(\pi_X)_* : (\Delta^n(X))^G \rightarrow \Delta^n(X/G)$. The main aim of the paper is the following:

Theorem. Let G be simple and connected, and let V be an irreducible nontrivial G -module such that $\dim V/G > 0$. Then the following are equivalent

- (1) V is 2-modular;
- (2) V is 2-large;
- (3) $(\pi_V)_*$ is graded surjective;
- (4) $(\pi_V)_*$ is surjective;
- (5) V/G has no codimension one strata;
- (6) V is not coregular.

Reviewer: [R.Salvi \(Milano\)](#)

MSC:

- [14M17](#) Homogeneous spaces and generalizations
- [16S32](#) Rings of differential operators (associative algebraic aspects)
- [13N10](#) Commutative rings of differential operators and their modules
- [14L30](#) Group actions on varieties or schemes (quotients)

Cited in **6** Documents

Keywords:

algebraic group acting on a complex algebraic variety; algebra of algebraic differential operators; quotient morphism

Full Text: [DOI](#)