ICM 1998, Berlin, Aug. 18–27

Abstracts of Short Communications and Posters

Section:

2. Algebra

1991 MS Classification: 13, 12

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Rationality of Some Projective Linear Actions

Let K be any field, V a finite-dimensional vector space over K, $\sigma \in GL(V)$ where the order of σ can be finite or infinite. Note that it is unnecessary to assume that K is algebraically closed. Theorem. If $K(V)$ and $K(\mathbb{P}(V))$ denote the function fields of V and $\mathbb{P}(V)$ respectively, then both $K(V)^{<\sigma>}$ and $K(\mathbb{P}(V))^{<\sigma>}$ are rational (= purely transcendental) over K, provided that $\dim_K V \leq 3$. Similar results hold for a cyclic affine action. This is a joint work with H. Ahmad and M. Hajja.