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Polynomial and power series invariants for finite groups

This is a report on joint work with Peter Webb.

Let G be a finite group, k a perfect field of characteristic p , and V a finite dimensional kG -module. We let G act on the power series $k[[V]]$ by linear substitutions and address the question of when the invariant power series $k[[V]]^G$ form a unique factorization domain. For a permutation module for a p -group, the answer is always positive. On the other hand, if G is a cyclic group of order p and V is an indecomposable kG -module of dimension r with $1 \leq r \leq p$, the invariant power series form a unique factorization domain if and only if r is equal to 1, 2, $p - 1$ or p . This contradicts a conjecture of Peskin. In contrast, a theorem of Nakajima completely answers the question of when the invariant polynomial functions $k[V]^G$ form a unique factorization domain; for a p -group in characteristic p , the answer is always yes.

Alle Interessierten sind herzlich eingeladen.