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On the depth of separating algebras of finite groups

Suppose G is a finite group acting linearly on a k-vector space V and consider the ring of invariants $k[V]^G$. A separating algebra is a subalgebra A of $k[V]^G$ with the same orbit separation properties.

There has been much recent interest in separating algebras, as it is often easier to compute generating sets for separating algebras rather than their parent invariant rings. In the non-modular case, $k[V]^G$ is a Cohen–Macaulay ring, and so the inequality $\mathrm{depth}(A) \leq \mathrm{depth}(k[V]^G)$ holds trivially for all separating algebras $A \subset k[V]^G$. In this talk we will give examples in the modular case where this inequality also holds.