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*On inhomogeneous modular invariants of finite groups*

Let  $k$  be a field and let  $G$  be a finite group. We study ungraded, commutative  $k$ -algebras  $R$  on which  $G$  acts by  $k$ -algebra automorphisms rendering  $R$  a projective  $kG$ -module. Such *projective  $k - G$ -algebras* and their invariants have a beautiful structure theory and they arise in invariant theory in the study of certain localisations.

In the case of  $p$ -groups in characteristic  $p$ , we describe the algebra  $D_k$ , which is a generator in the category of commutative, projective  $k - P$ -algebras, and we give explicit generators and relations for the invariant ring  $D_k^P$ . We also define and describe *simple cyclic* projective  $k - P$ -algebras, which include the Galois extensions of  $k$ , and *universal* projective  $k - P$ -algebras, from which all the others can be constructed by forming quotients and “extending invariants”.

This is joint work with my colleague C. F. Woodcock (Kent).