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Essential dimension of finite p-groups
(joint work with A. S. Merkurjev, cf. [3])

Abstract: The notion of the essential dimension ed(G) of a finite group G over a field F was introduced in [2]. The integer ed(G) is equal to the smallest number of algebraically independent parameters required to define a Galois G-algebra over any field extension of F. If V is a faithful linear representation of G over F then ed(G) ≤ dim(V) (cf. [1, Prop. 4.15]). The essential dimension of G can be smaller than dim(V) for every faithful representation V of G over F. For example, we have ed(Z/3Z) = 1 over Q or any field F of characteristic 3 (cf. [1, Cor. 7.5]) and ed(S_3) = 1 over C (cf. [2, Th. 6.5]).

The main result of the talk says that if G is a p-group and F is a field of characteristic different from p containing p-th roots of unity, then ed(G) coincides with the least dimension of a faithful representation of G over F.

References