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On p-chief factors of finite groups. (English) Zbl 0575.20012

Commun. Algebra 13, 2433-2447 (1985).

The author uses methods of modular representation theory to characterize p-constrained and p-solvable groups in terms of p-chief factors. For a finite group G and a prime p the principal block of the group algebra FG over the prime field $F = GF(p)$ plays a central role. The following results are obtained: G is p-constrained iff each irreducible FG -module belonging to the principal block is a composition factor of a suitable tensor product of p-chief factors. G is p-solvable iff the multiplicity of every irreducible FG -module E as a complemented chief factor in a chief series of G equals the multiplicity of E in the second Loewy layer of the principal indecomposable FG -module.

Reviewer: W.Hamernik

MSC:

20C20 Modular representations and characters

20D10 Finite solvable groups, theory of formations, Schunck classes, Fitting classes, π -length, ranks

20C05 Group rings of finite groups and their modules (group-theoretic aspects)

Cited in 3 Reviews
Cited in 8 Documents

Keywords:

p-constrained groups; p-solvable groups; p-chief factors; principal block; group algebra; chief series; Loewy layer; principal indecomposable FG-module

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