A classification of two-generated cyclic-by-abelian finite p-groups

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a joint work with

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Abstract

A fundamental problem in group theory is to classify up to isomorphism groups satisfying certain conditions in terms of some group invariants. A relevant family is that of finite p-groups. However, a quotation attributed to P. Hall states that "there is not apparent limit to the complication of a prime-power group". Despite that one should expect that the literature contains classifications of some families of p-groups satisfying some strong conditions. Our initial motivation was to study the Modular Isomorphism Problem, which states that the isomorphism type of the group algebra of a p-group over a field of characteristic p determines the isomorphism type of the group, in the family of groups with cyclic derived subgroups. The special case when G is 2-generated of the class of G at most 2 was solved recently [2]. We expected that at least for 2-generated such groups a classification must be available in the literature. However this is not the case in general unless stronger conditions are imposed [1, 3, 4]. We fill this gap. More precisely we give a complete classification for the two generated cyclic-by-abelian finite groups of prime power order, associating to each one of such groups a tuple of 12 numerical invariants.

Keywords

Finite p-groups.

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