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Capability of p -groups of class 2 and exponent p . Preliminary report.

A group G is capable if there exists a group H such that $G \cong H/Z(H)$. A complete characterization of capability exists for abelian groups G that are direct sums of cyclic groups; metacyclic groups; extra-special p -groups; and some restricted classes (e.g., 2-generated p -groups of class 2).

For the class of p -groups of class 2 and exponent p , some necessary and some sufficient conditions are known, but no complete characterizations. We discuss some ways of constructing capable and non-capable groups in this class, and the following conjecture:

Conjecture. Let G be a p -group of class two and exponent p . Then G is capable if and only if for every generating set X of G , we have $\cap_{x \in X} [C_G(x), C_G(x)] = 1$. (Received September 19, 2010)