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GROUP EXTENSIONS AND THEIR TRIVIALISATION

by A. J. BERRICK ¹⁾

ABSTRACT

This is a discussion of the set of all (equivalence classes of) extensions with a given kernel K and quotient Q , with emphasis on the topological approach. A phenomenon studied is of groups Q for which all such extensions are trivial whenever K belongs to a broad class of groups. It is shown that this applies to many McLain groups which are also given a significant generalisation here.

INTRODUCTION

The following remarks were prompted by the paper [12] of de la Harpe and McDuff (whose encouragement in writing up this material is gratefully acknowledged). An interesting phenomenon was noted there: certain groups, so large as to have all homology groups and countable homomorphisms trivial, admit no non-trivial extensions with finitely generated abelian kernel. Here we place this observation in a broader setting and record two further classes of example, one of which involves a strong generalisation of groups such as Steinberg and McLain groups that are closely related to matrix groups. Although some of the general results will be more or less known to group-theorists, the topological methods introduced should be of interest. We shall work only with discrete groups, even when there is an obvious non-discrete topology available. Helpful comments of B. Hartley, T. B. Ng and D. Robinson have been of assistance to this work.

¹⁾ AMS (1980) Subject Classification. Primary 20E22; Secondary 20F28, 20H20, 20J05, 55R15.