

1154-20-755

**Heiko Dietrich** and **Alexander Hulpke\*** (hulpke@colostate.edu), Department of Mathematics, Colorado State University, Fort Collins, CO 80526. *Finding finite representations of finitely presented groups*. Preliminary report.

A principal tool for the study of finitely presented groups is to find representations through so-called quotient algorithms. Such algorithms take an existing quotient  $\varphi: G \rightarrow Q$ , and find homomorphisms  $\psi: G \rightarrow N.Q$  for extensions  $N.Q$  with  $N$  elementary abelian, such that  $\varphi$  factors through  $\psi$ . The  $p$ -quotient and the solvable quotient algorithms are examples of such algorithms, and have been used for a long time. Using a generalization of the  $p$ -covering group that arises from the radical factor of the representation module, and is parameterized by irreducible module type and number of generators, we can generalize the idea of the existing algorithms to the case of an arbitrary, nonsolvable (finite)  $Q$ . I will describe the algorithm and give examples of its performance. (Received September 10, 2019)