



GEOMETRIC AND ASYMPTOTIC GROUP THEORY
WITH APPLICATIONS
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*Logspace and compressed-word computations in nilpotent groups:
subgroup problems*

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Abstract:

Several fundamental computational problems for finitely generated nilpotent groups have recently been shown to be solvable using only logarithmic space resources. These include the conjugacy and membership problems, computing presentations for subgroups, and others. Continuing the development of this algorithmic theory, we show that several problems related to subgroups of a nilpotent group G are also computable in logarithmic space: conjugacy of subgroups, intersection of cosets, computing the normalizer and isolator of a subgroup, and computing the torsion subgroup of G . We also consider the more difficult case where input words are provided in compressed form as straight-line programs, and give polynomial-time solutions in this scenario.

The talk will review the techniques used in the fundamental problems and give high-level outlines of solutions to the subgroup problems. This is joint work with A. Miasnikov and D. Ovchinnikov.