

1071-20-80

**Volker Diekert\*** ([diekert@fmi.uni-stuttgart.de](mailto:diekert@fmi.uni-stuttgart.de)), Universitaetsstrasse 38, 70569 Stuttgart, Germany. *Solving word problems in groups by data compression.*

It is well-known that data compression might be essential to solve word problems in groups efficiently. For example, Schleimer showed that the automorphism group of a free group has a WP in PTIME using straight-line programs. Much higher compression rates can be obtained by power circuits. Power circuits were introduced by Myasnikov, Ushakov and Won and they showed that the WP of the Baumslag group  $G_{(1,2)}$  with one defining relation  $a^{a^b} = a^2$  is in PTIME. This result has been surprising, since the Dehn function of  $G_{(1,2)}$  is non-elementary by a result of Gersten; and  $G_{(1,2)}$  was believed to be among the hardest one-relator groups w.r.t. the complexity of the word problem.

In my lecture I will report on some new results in this area. (Received February 20, 2011)