

A NON-RESIDUALLY SOLVABLE HYPERLINEAR ONE-RELATOR GROUP

JOHN BANNON, REVIEWED BY THOMAS KOBERDA

The goal of the note under review is to prove the existence of a non-residually solvable, hyperlinear group. A group is called hyperlinear if it is isomorphic to a subgroup of a metric ultraproduct of a suitable family of unitary groups of finite rank. The group discussed in the note is the one-relator group

$$G = \langle a, b \mid a^{-1}[a, a^b] \rangle.$$

This group was known by G. Baumslag as an example of a non-cyclic group, all of whose finite quotients are cyclic. The work of the note is to prove that G is hyperlinear. This is done by exhibiting an isomorphism between G and a certain HNN extension. Then, the author appeals to some results of Ueda ([*J. Funct. Anal.* 225, no. 2 (2005), 383–426; MR2152505 (2006k:46100)] and [*Illinois J. Math.* 52, no. 3 (2008), 705–725; MR2546003 (2010h:46093)]) in the theory of Von-Neumann algebras to establish hyperlinearity.

DEPARTMENT OF MATHEMATICS, HARVARD UNIVERSITY, 1 OXFORD ST., CAMBRIDGE, MA 02138

E-mail address: koberda@math.harvard.edu