Meeting: 1004, Bowling Green, Kentucky, SS 14A, Special Session on Geometric Topology and Group Theory

1004-20-214 **Alexander Yurievich Olshanskii*** (alexander.olshanskiy@vanderbilt.edu), 1326 Stevenson Center, Department of Mathematics, Vanderbilt University, Nashville, TN 37240, and **Mark Valentinovich Sapir**. *Groups with small Dehn functions.*

Here we consider only finitely presented groups. Recall that a group with a subquadratic Dehn function is hyperbolic. In 2004 we constructed groups G such that (1) G is a multiple HNN extension of a free group, (2) the Dehn function of G is $n^2 \log n$, (3) the conjugacy problem is undecidable for G. Now we show that this result is sharp: If $d(n)$ is the Dehn function of a multiple HNN extension of a free group and the constructive limit of $d(n)/n^2 logn$ is 0, then the group has decidable conjugacy problem. We also construct a group H whose Dehn function $f(n)$ has unusual behavior implying, in particular, that the assymptotic cone of the group H having a small Dehn function, is not simply connected: Denote the function $n^2 \log n / \log \log n$ by $F(n)$. Then (a) $c(1)n^2 < f(n) < c(2)F(n)$ for some positive constants $c(1)$, $c(2)$, and all sufficiently large n; (b) $f(n(i)) < c(3)n(i)^2$ for a constant $c(3)$ and an infinite sequence of integers $n(i)$; (c) $f(m(i)) > c(4)F(m(i))$ for a positive constant $c(4)$ and an infinite sequence $m(i)$. (Received January 25, 2005)