Meeting: 999, Nashville, Tennessee, SS 5A, Special Session on Topological Aspects of Group Theory

999-57-132 **Emina Alibegovic** and **Mladen Bestvina*** (bestvina@math.utah.edu), Department of Mathematics, University of Utah, 155 South 1400 East, Salt Lake City, UT 84112. *Limit groups are CAT(0).* Preliminary report.

We prove that every limit group acts discretely, cocompactly, isometrically on a CAT(0) space.

Limit groups arise naturally in the study of equations over free groups and have appeared in the literature under various names. They were termed "limit groups" by Zlil Sela reflecting his topological approach to the subject in which one studies limiting R-trees of sequences of homomorphisms to a free group. The quickest definition of a limit group is that it is a finitely generated group L with the property that for every finite collection $x_1, x_2, \cdots, x_n$ of nontrivial elements there is a homomorphism $f : L \to F$ to a free group not killing any x_i. The interested reader will have fun showing that the fundamental group of a closed orientable surface is a limit group.

The method of proof is this. There is a special class of limit groups called *ω-residually free towers*. These are obviously CAT(0). Sela showed that any limit group L embeds in one of these. One then simply shows that the L-covering space contains a compact core which is locally CAT(0). (Received August 18, 2004)