

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

999-20-288 **Lee Mosher*** (mosher@andromeda.rutgers.edu) and **Michael Handel.** *Growth of Free Group Outer Automorphisms and their Inverses, and Parageometric Outer Automorphisms.* Preliminary report.

Given an outer automorphism Φ of a free group F_r , the growth $\lambda(\Phi)$ is the supremum over all conjugacy classes C in F_r of $\limsup |\Phi^m(C)|^{1/m}$ where $|\cdot|$ denotes the length of the shortest word in the given conjugacy class. We study the relation between $\lambda(\Phi)$ and $\lambda(\Phi^{-1})$ when Φ is completely irreducible (irreducible with irreducible powers). While these two numbers are often different, we show that the ratio $\log\lambda(\Phi)/\log\lambda(\Phi^{-1})$ is bounded above by a constant depending only on the rank r . On the other hand, for a certain class of outer automorphisms called "parageometric", we prove a strict inequality $\lambda(\Phi^{-1}) < \lambda(\Phi)$. As an application, we prove that a completely irreducible automorphism is geometric (it arises from a surface automorphism) if and only if its attracting and repelling trees in the boundary of outer space are both geometric (dual to some measured foliation on some 2-complex). The latter result was proved independently by Guirardel. (Received August 26, 2004)