Counting loxodromics for hyperbolic actions

Giulio Tiozzo

tiozzo@math.utoronto.ca

Let $G$ be a hyperbolic group acting on a hyperbolic metric space $X$. We show that the set of elements of $G$ which act as loxodromic isometries of $X$ is generic. That is, for any finite generating set of $G$, the proportion of $X$-loxodromics in the ball of radius $n$ about the identity in $G$ approaches 1 as $n$ tends to infinity.

We also establish several results about the behavior in $X$ of the images of typical geodesic rays in $G$; for example, we prove that they make linear progress in $X$ and converge to the Gromov boundary of $X$. Our techniques make use of the automatic structure of $G$, Patterson-Sullivan measure, and the ergodic theory of random walks for groups acting on hyperbolic spaces. We discuss various applications, in particular to mapping class groups, Out$(F_N)$, and right-angled Artin groups.

This is joint work with I. Gekhtman and S. Taylor.