

Title: Stationary random subgroups and injectivity radius in negative curvature

Abstract:

Let G be a rank one simple Lie group. In joint work with Arie Levit we show that non-free stationary actions of G have "large" stabilizers. Namely, if the stabilizers are discrete then they have full limit sets and exponential growth rate greater than half of the entropy divided by the drift of the random walk, in particular bounded away from 0.

As an application, we use random walk techniques to obtain a conditional rank one analogue of the recent theorem of Fraczyk-Gelander in higher rank. Namely, if the bottom of the spectrum of the Laplacian on the hyperbolic manifold M (or more generally rank one locally symmetric space M) is equal to that of its universal cover then M has points with arbitrary large injectivity radius.

We prove related results for general isometry groups of proper geodesic Gromov hyperbolic spaces.