

Quasigeodesic and pseudo-Anosov flows

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Abstract: We will discuss two kinds of flows on 3-manifolds: quasigeodesic and pseudo-Anosov. Quasigeodesic flows are defined by a tangent condition, that each flowline is coarsely comparable to a geodesic. In contrast, pseudo-Anosov flows are defined by a transverse condition, where the flow contracts and expands the manifold in different directions.

When the ambient manifold is hyperbolic, there is a surprising relationship between these apparently disparate classes of flows. We will show that a quasigeodesic flow on a closed hyperbolic 3-manifold has a "coarsely contracting-expanding" transverse structure, and use this to show that every such flow has closed orbits. We will also illustrate an approach to Calegari's conjecture, that every quasigeodesic flow can be deformed into a pseudo-Anosov flow.