

Coarse topology of leaves of foliations

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Abstract

In this talk, I will discuss the question when a non-compact manifold can be quasi-isometric to a leaf in a foliation of a compact manifold. The initial point is a result of Paul Schweitzer, that every Riemannian metric on a non-compact manifold can be deformed so that the resulting Riemannian manifold is not quasi-isometric to a leaf in a codimension one foliation of a compact manifold. We show that the coarse homology of these non-leaves is non-finitely generated. This observation motivates the question: Does every leaf in a foliation of a compact manifold have finitely generated coarse homology?

This can be answered in the negative in two ways: Firstly, there exists a large class of two dimensional leaves that have non-finitely generated coarse homology. Moreover, we improve Schweitzer's construction by showing that every Riemannian metric can be deformed to a non-leaf without affecting the coarse homology. In particular, we find non-leaves with trivial coarse homology.