DIFFERENTIAL GEOMETRY/PDE SEMINAR

WEDNESDAY, October 28
Communications 228
3:45 pm

Some Questions of Integral Geometry on Anosov Manifolds

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We are interesting in questions like the following one: to what extent is a function on a closed Riemannian manifold determined by its integrals over all closed geodesics. Of course the question is sensible only for manifolds with sufficiently many closed geodesics. Anosov manifolds constitute the natural class of Riemannian manifolds with a rich family of closed geodesics. A closed Riemannian manifold is called the *Anosov manifold* if its geodesic flow is of Anosov type. The class of Anosov manifolds is wider than the class of negatively curved manifolds.

We prove that a smooth function on an Anosov manifold is uniquely determined by its integrals over all closed geodesics. The similar result is valid for 1-forms: if a smooth 1-form on an Anosov manifold integrates to zero around every closed geodesic, then it is an exact form. Then we discuss the corresponding question for symmetric tensor fields of higher rank. In the latter case our results depend essentially on regularity of the stable and unstable foliations. In the case of rank two tensor fields, the question under consideration relates closely to the spectral rigidity problem. We discuss this relationship too.

For more information about this seminar, view the Differential Geometry/PDE Seminar World-Wide Web page at `http://www.math.washington.edu/DGPDE/dg.html` or from the **Seminars, Colloquia, and Conferences** section of the Math Department home page.