RAPID MIXING FOR EXTENSIONS OF ANOSOV FLOWS

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Abstract

We will discuss the speed of mixing of extensions of chaotic (Anosov) flows to principal bundles. For example, this includes the frame flow on the bundle of orthonormal frames over a negatively curved Riemannian manifold, and our result in this setting guarantees that ergodicity of the frame flow implies its rapid mixing, that is, mixing faster than Ct^{-N} for any $N > 0$ (here $t > 0$ denotes time). The key tool is the introduction of a novel semiclassical calculus on principal G-bundles that we call the Borel-Weil calculus, where the semiclassical parameters correspond to the highest roots parametrizing irreducible representations of G. The calculus can be shown to have further applications to hypoellipticity and quantum ergodicity of horizontal (sub-)Laplacians.
Joint work with Thibault Lefeuvre.