

Rate of equidistribution for the unstable manifolds of Anosov diffeomorphisms

Dmitry Zubov ^{*†}

NRU Higher School of Economics

Let M be a compact Riemannian manifold. For a C^3 smooth topologically mixing Anosov diffeomorphism $F : M \rightarrow M$, we study the equidistribution properties of the unstable manifolds with respect to the Margulis measure of maximal entropy \mathbf{m} . Extending the results of Bufetov and Bufetov-Forni on geodesic/horocycle flows on compact Riemann surfaces of constant negative curvature to a non-linear setting, we prove that, under certain bounded distortion assumptions on the diffeomorphism, the leafwise averages on the unstable leaves of a C^2 smooth function $\psi : M \rightarrow \mathbb{R}$ with $\mathbf{m}(\psi) = 0$ are controlled by a finitely additive measure on the unstable foliation, invariant under the holonomy along stable leaves.

Using the method Gouëzel and Liverani, we construct a Banach space of currents which admits an F -invariant finite dimensional subspace whose elements induce holonomy invariant finitely additive measures.

^{*}This article was prepared within the framework of the Academic Fund Program of the National Research University Higher School of Economics (HSE) in 2018-2019 (grant No. 18-05-0019) and by the Russian Academic Excellence Project “5-100”.

[†]The author is a Young Russian Mathematics award winner and would like to thank its sponsors and jury.