

Invariance principle and rigidity of high entropy measures

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A deep analysis of Lyapunov exponents of stationary sequence of matrices going back to Furstenberg, for more general linear cocycles by Ledrappier and generalized to the context of non linear cocycles by Avila and Viana gives an invariance principle for invariant measures with vanishing central exponents. In a joint work with J. Yang we give a new criterium formulated in terms of entropy for the invariance principle and in particular obtain a simpler proof for some of the known invariance principle results.

As a byproduct, we study ergodic measures of partially hyperbolic diffeomorphisms whose center foliation is 1-dimensional and forms a circle bundle. We show that for any such C^2 diffeomorphism which is accessible, weak hyperbolicity of ergodic measures of high entropy implies that the system itself is of rotation type. As mentioned to us by Sylvain Crovisier, our result may be also used to give a more precise information on the results of Diaz-Gelfert-Rams where they study transitive step skew product maps modeled over a complete shift whose fiber maps are circle maps.