ENTROPY MAXIMIZING MEASURES FOR SOME PARTIALLY HYPERBOLIC SYSTEMS

This is joint work with Federico Rodriguez Hertz, Jana Rodriguez Hertz and Ali Tahzibi.

In this talk we shall discuss the existence, finiteness and (non)uniqueness of entropy maximizing measures for some partially hyperbolic systems. The type of systems we shall deal with essentially includes the following examples:

$$F : \mathbb{T}^2 \times \mathbb{S}^1 \to \mathbb{T}^2 \times \mathbb{S}^1$$
$$(x, \theta) \mapsto (Ax, f_x(\theta))$$

where f_x is a diffeomorphism of the circle depending continuously with x and $A \in SL(2, Z)$ is a hyperbolic matrix.

Theorem . *Let $f : M^3 \to M^3$ be a $C^{1+\alpha}$ partially hyperbolic diffeomorphism with the accessibility property, such that its center bundle integrates to a foliation by circles. Then one and only one of the following occurs:*

(1) *f admits a unique entropy maximizing measure μ. (f, μ) is isomorphic to a Bernoulli shift and $\lambda_c(\mu) = 0$.*
(2) *There is a finite number of ergodic entropy maximizing measures, all with nonzero central exponent. There are at least one measure with positive central exponents and one with negative central exponent. All of them have a common Bernoulli factor and are finite extensions of this factor.*

Moreover, the second possibility holds for a C^1 open and C^∞ dense set of diffeomorphisms in the hypothesis of the theorem.

In particular the Theorem gives open sets of topologically mixing diffeomorphism with more than one entropy maximizing measure, this answers a question of J. Buzzi and T. Fisher.