CONSERVATIVE ANOSOV DIFFEOMORPHISMS OF THE TWO TORUS WITHOUT AN ABSOLUTELY CONTINUOUS INVARIANT MEASURE

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Abstract: Markov partitions introduced by Sinai and Adler and Weiss are a tool that enables transfering questions about ergodic theory of Anosov Diffeomorphisms into questions about Topological Markov Shifts and Markov Chains. This talk will be about a reverse reasonning, that gives a construction of C^1 conservative (satisfy Poincare's reccurrence) Anosov Diffeomorphism of \mathbb{T}^2 without a Lebesgue absolutely continuous invariant measure. By a theorem of Gurevic and Oseledec, this can't happen if the map is $C^{1+\alpha}$ with $\alpha > 0$. Our method relies on first choosing a nice Toral Automorphism with a nice Markov partition and then constructing bad conservative Markov measure on the symbolic space given by the Markov partition. We then push this measure back to the Torus to obtain a bad measure for the Toral automorphism. The final stage is to find by smooth realization a conjugating map $H: \mathbb{T}^2 \to \mathbb{T}^2$ such that $H \circ F \circ H^{-1}$ with Lebesgue measure is metric equivalent to $(\mathbb{T}^2, F, Bad Measure)$.