

COHOMOLOGICAL RIGIDITY AND THE ANOSOV-KATOK CONSTRUCTION

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Let f be a smooth volume preserving diffeomorphism of a compact manifold and ϕ a known smooth function of zero integral with respect to the volume. The linear cohomological equation over f is $\psi \circ f - \psi = \phi$, where the solution ψ is required to be smooth.

Diffeomorphisms f for which a smooth solution ψ exists for every such smooth function ϕ are called Cohomologically Rigid. Herman and Katok have conjectured that the only such examples up to conjugation are Diophantine rotations in tori.

We study the relation between the solvability of this equation and the fast approximation method of Anosov-Katok and prove that fast approximation cannot construct counter-examples to the conjecture.