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by

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STABLE GROUP ACTIONS ON UNIFORM SPACES

PRAMOD DAS AND TARUN DAS

Abstract. We extend the notions of topological stability, shadowing and persistence for homeomorphisms to finitely generated group actions on uniform spaces and prove that an expansive action with either shadowing or persistence is topologically stable. Using the concept of null set of a Borel measure μ, we extend the notions of μ-expansivity, μ-topological stability, μ-shadowing and μ-persistence for homeomorphisms to finitely generated group actions on uniform spaces and prove that a μ-expansive action with either μ-shadowing or μ-persistence is μ-topologically stable.

1. Introduction

Topological stability is a fundamental notion of a dynamical system which guarantees that the qualitative behavior of trajectories remains unaffected by continuous small perturbations. In Lyapunov stability, one considers perturbations of initial conditions in a fixed system. Unlike in Lyapunov stability, in topological stability, one considers perturbations of the system itself. Walters' stability theorem applied to Anosov diffeomorphisms of compact smooth manifolds is one of the finest results in differentiable dynamics.

Theorem 1.1 ([15, Theorem 1])**.** *Let M be a compact manifold and let $f : M \to M$ be a diffeomorphism. If f is Anosov, then it is topologically stable.*

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Key words and phrases. expansivity, persistence, shadowing, topological stability.

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