Ludvík Janoš

The Banach contraction mapping principle and cohomology

Comment.Math.Univ.Carolinae 41,3 (2000) 605-610.

Abstract: By a dynamical system (X, T) we mean the action of the semigroup $(\mathbb{Z}^+, +)$ on a metrizable topological space X induced by a continuous selfmap $T : X \to X$. Let $M(X)$ denote the set of all compatible metrics on the space X. Our main objective is to show that a selfmap T of a compact space X is a Banach contraction relative to some $d_1 \in M(X)$ if and only if there exists some $d_2 \in M(X)$ which, regarded as a 1-cocycle of the system $(X, T) \times (X, T)$, is a coboundary.

Keywords: B-system, E-system
AMS Subject Classification: 54H15, 54H25, 37B99