

ON A CLASS OF COCYCLES HAVING ATTRACTORS WHICH CONSIST OF SINGLETONS

GRZEGORZ GUZIK

ABSTRACT. We give a new simple sufficient condition for existence of the global pullback attractor which consists of singletons for general cocycle mappings on an arbitrary complete metric space. In particular, we need not have any structure on a parameter space, so the criterion can be applied in both cases: nonautonomous as well as random dynamical systems. Our considerations lead us also to new large class of iterated function systems with point-fibred attractors.

1. Introduction

In the theory of nonautonomous as well as random dynamical systems the notion of a cocycle mapping is fundamental. A cocycle is, roughly speaking, a mapping which acts on the product of a parameter space and a phase space (usually of different nature), inducing an autonomous skew product (semi)flow. On a parameter space an autonomous (semi)flow is given. In general, it can be interpreted as perturbations or a noise. The reader interested in applications of nonautonomous/random dynamical systems can find a vast literature, for example cited in monographs [3], [9] and [19].

2010 *Mathematics Subject Classification.* Primary: 28A80, 54H20; Secondary: 26E25, 47H04, 93E03.

Key words and phrases. Cocycle; skew-product semiflow; iterated function system; topological limit; pullback attractor.

The research of the author was supported by the Polish Ministry of Science and Higher Education.