

Structure of the set of periods for the Lorenz map

Abstract. We show that the structure of the set of periods for a class of maps of the interval into itself with a single discontinuity (Lorenz maps) is also given by the Sarkovskii's ordering.

1. Introduction

In the study of the geometrical model of the Lorenz attractor an one-dimensional map plays an important role, we refer to such map as the Lorenz map (see [GH], [Sp] and [T]), although it is different from the one-dimensional map presented by Lorenz (see [L]).

In this note we are interested in the structure of the set of periods of the Lorenz map.

Let $I = [-1, 1]$. We shall say that a map $f: I \setminus \{0\} \rightarrow I$ is a Lorenz map if

- L1) f is odd (i.e. $f(-x) = -f(x)$),
- L2) f is once continuously differentiable, and $f' > 1$
- L3) $f(-1) < 0$,
- L4) f has a single discontinuity at 0 , and $\lim_{x \rightarrow 0^+} f(x) = -1$,
 $\lim_{x \rightarrow 0^-} f(x) = 1$.

We extend a Lorenz map to all the interval I defining

- L5) $f(0) = 1$.