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Topological Methods in Nonlinear Analysis  
DOI: 10.12775/TMNA.2024.023

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## MILNOR ATTRACTORS AND PERIOD INCREMENTING ON PATTERN ITERATIONS OF FLAT TOP TENT MAPS

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**ABSTRACT.** In this paper, we consider the family of non-autonomous dynamical systems obtained by iterating tent maps with a flat top of constant value  $u$  introduced at instants  $i$  such that  $s_i = 0$ , where  $s$  is a binary sequence that we call the iteration pattern. We introduce symbolic dynamics and study the kneading invariants for these dynamical systems. More precisely, we define the kneading invariants  $K(u, s)$  as symbolic sequences and study sufficient conditions for a symbolic sequence to be a kneading invariant  $K(u, s)$  for some  $u$ , for each iteration pattern  $s$ . Finally, we describe the parameters  $u$  for which there are Milnor attractors for iteration patterns  $s$  such that  $s_{np} = 0$  for all  $n$ , as limits of parameter sequences corresponding to local attractors, organized according to a period-incrementing structure.

### 1. Introduction

In [4], a method of chaos control designated as “control with simple limiters” was introduced. The general idea of the procedure is to add an external load to the system, which limits the phase space in such a way that the orbits in the forbidden area are eliminated, see [4], [12], [16]–[18].

Since its proposal, control with simple limiters has been widely used in the control of chaos in areas as diverse as cardiac dynamics, [7], telecommunications or electric converters [18], population dynamics [9], or market dynamics [8].

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2020 *Mathematics Subject Classification.* 37E05, 37B55, 37G35, 37B10.

*Key words and phrases.* Non-autonomous dynamical systems; interval maps; attractors; symbolic dynamics; bifurcation diagrams.

The authors were partially supported by FCT Fundação para a Ciência e a Tecnologia, Portugal, through the project UID/MAT/04674/2013, CIMA and ISEL.