Devils' Staircaise route to chaos in a forced relaxation oscillator

Antonio Falcó
Departament d'Economía i Història Econòmica,
Facultat de Ciències Econòmiques,
Universitat Autònoma de Barcelona

Abstract

We use one-dimensional techniques to characterize the Devils' Staircase route to chaos of the Van der Pol relaxation oscillator with periodic forcing term. In particular we give the behaviour, for certain range of parametrer values of a Cantor set of solutions with a certain rotation set asociated to a rational number. We described this solutions by using concepts of symbolic dynamics. Finally, we explain the phenomena observed experimentally in the system by Kennedy, Krieg and Chua [9] related with the apareance of secondary staircases intercaled into the primary staircases observed by Van der Pol and Van der Mark [15].