

Route to chaos for open maps and functions with plateaus, a parallel study of the transition to chaos

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Abstract:

We will introduce in this talk renormalisation groups methods to describe the transition to chaos for simple Lorenz maps with plateaus. Our results uses properties on open maps, or functions with holes, and can be applied in fluid dynamics and electronics.

A well-known and simple example of route to chaos is the standard unimodal map $\mu(x-1)$ where orbits of period 2^n appears on the path to the transition to chaos. The unimodal map has positive entropy when it has orbits of period 2^n for all $n \geq 0$.

In this talk, we will focus on the doubling map, the tent map and two other similar functions with plateaus. We will present an induction process and describe its iterations to find all the possible routes to chaos for these four functions.

This talk is based on joint work with Paul Glendinning.