The Topology of Chaos
Chapter 1: Overview

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Can you explain my data?

I dare you to explain my data!
Motivation

Where is Tredicce coming from?

Feigenbaum:

\[ \alpha = 4.66920 16091 \ldots \]
\[ \delta = -2.50290 78750 \ldots \]
LSA Experimental Arrangement

Diagram showing experimental setup with labeled components.
Original Objectives

Construct a simple, algorithmic procedure for:

- Classifying strange attractors
- Extracting classification information from experimental signals.
Our Result

Result

There is now a classification theory.

1. It is topological
2. It has a hierarchy of 4 levels
3. Each is discrete
4. There is rigidity and degrees of freedom
5. It is applicable to $R^3$ only — for now
The 4 Levels of Structure

- Basis Sets of Orbits
- Branched Manifolds
- Bounding Tori
- Extrinsic Embeddings
Organization

LINKS OF PERIODIC ORBITS organize
BOUNDING TORI organize
BRANCHED MANIFOLDS organize
LINKS OF PERIODIC ORBITS