

# The Topology of Chaos

## Chapter 2: Experimental Challenge

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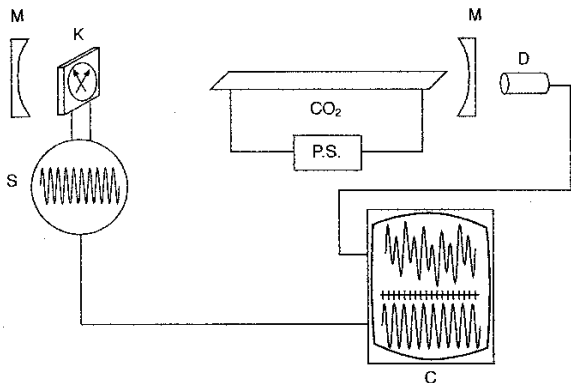
September 2, 2008

# Experimental Schematic

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## Laser Experimental Arrangement

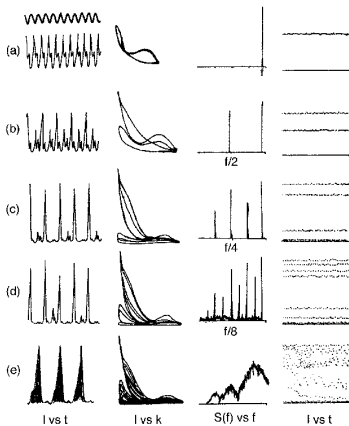


# Experimental Motivation

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## Oscilloscope Traces

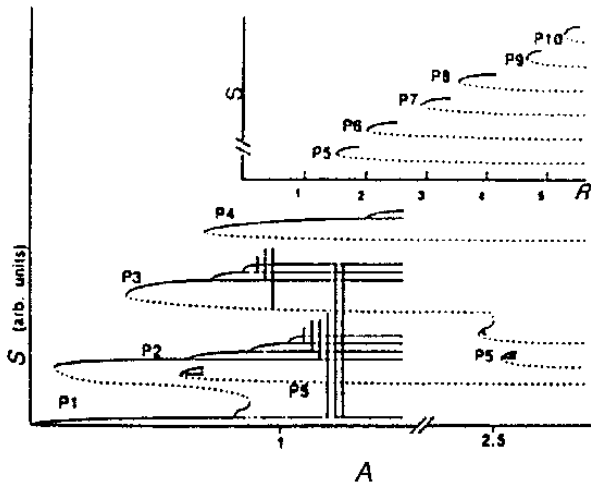


# Results, Single Experiment

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## Bifurcation Schematics

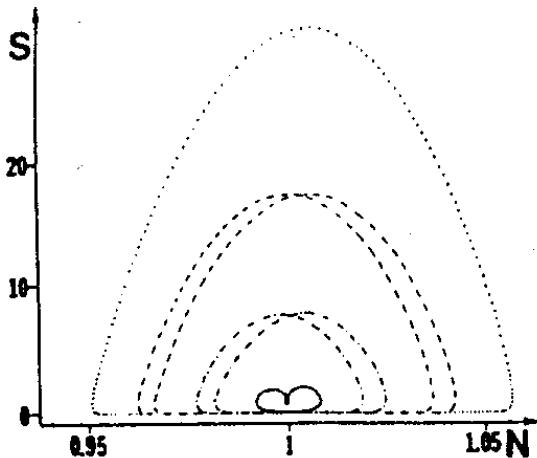


# Some Attractors

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## Coexisting Basins of Attraction

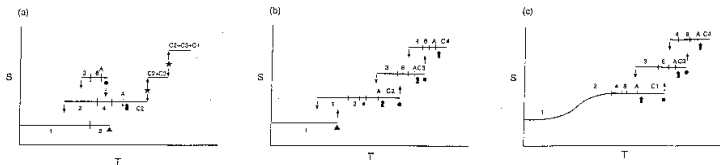


# Many Experiments

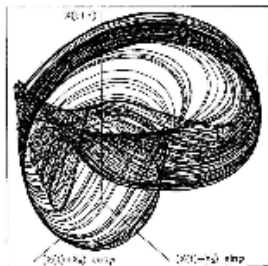
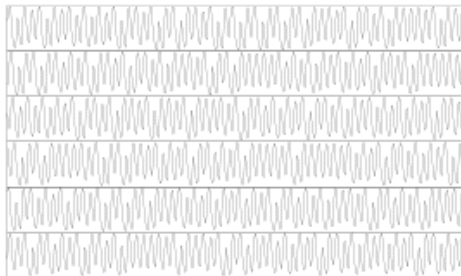
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## Bifurcation Perestroikas

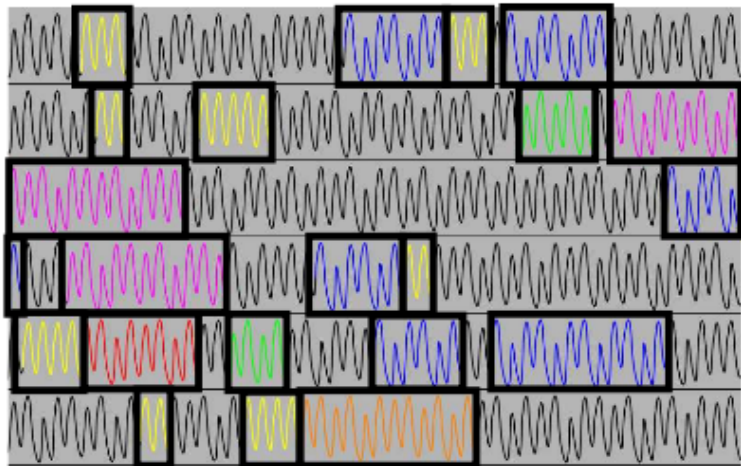


## Experimental Data: LSA



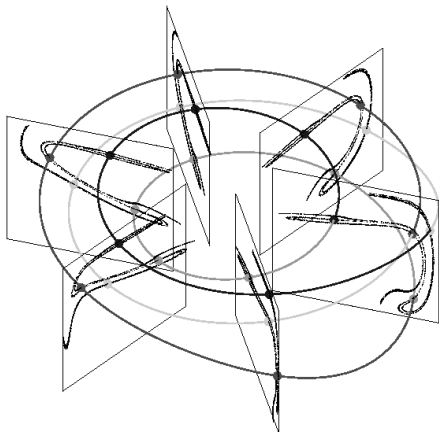
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## Experimental Data: LSA

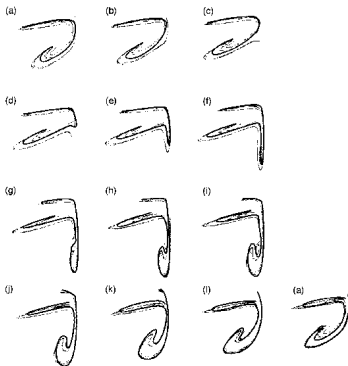




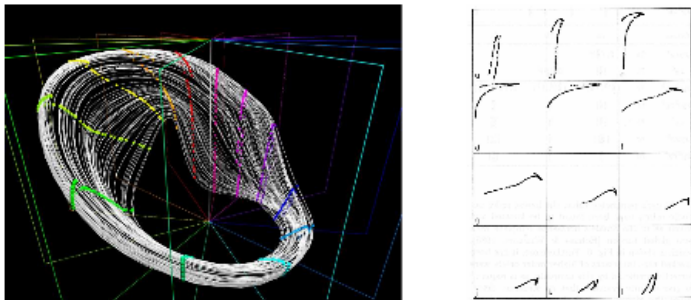
## Stretching & Squeezing in a Torus



## Rotating the Poincaré Section around the axis of the torus



## Rotating the Poincaré Section around the axis of the torus



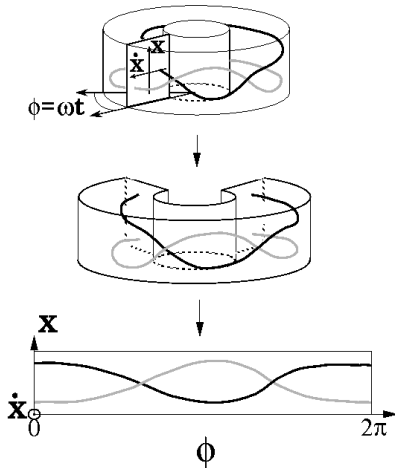
**Figure 2.** Left: Intersections of a chaotic attractor with a series of section planes are computed. Right: Their evolution from plane to plane shows the interplay of the stretching and squeezing mechanisms.

# Another Visualization

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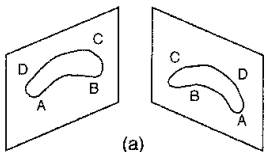
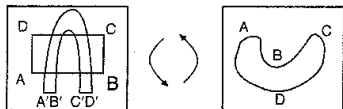
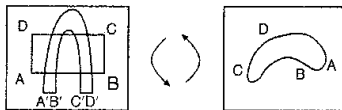
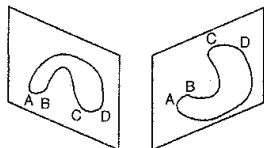
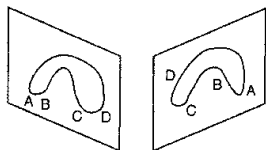
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## Cutting Open a Torus

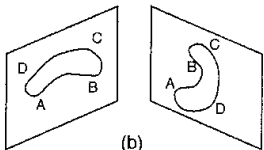


# Satisfying Boundary Conditions

## Global Torsion



(a)



(b)

## A Chemical Experiment

### The Belousov-Zhabotinskii Reaction

