

Seminar 3

Symbolic dynamics with applications

Abstract

Symbolic dynamics consists on modeling a topological or smooth dynamical system by a discrete space consisting of sequences of abstract symbols, each of which corresponds to a state of the system, with the dynamics given by the shift operator. We will present an introduction to symbolic dynamics, covering the basic topics, and we will study some of its applications in celestial mechanics and circuit theory. We follow the chapters 15 and 16 of [1] as structure of the talks. As complementary bibliography, we suggest [2].

Lecture 1, 3/10/19

Title: Introduction to Symbolic Dynamics and Chaos

Speaker: Salvador Borrós Cullell (UAB)

Lecture 2, 17/10/19

Title: The shift map and Cantor sets

Speaker: Òscar Rodríguez (UPC)

Lecture 3, 31/10/19

Title: The Shilnikov system

Speaker: Mar Giralt (UPC)

Lecture 4, 7/11/19

Title: The Horseshoe map

Speaker: Begoña Nicolás (UB)

Lecture 5, 14/11/19

Title: The double scroll attractor and homoclinic bifurcations

Speaker: Clara Cufí Cabré (UAB)

Lecture 6, 15/11/19

Title: Symbolic Dynamics an the Sitnikov problem

Speaker: Prof. Arturo Vieiro (UB)

References

- [1] M. W. Hirsch, S. Smale, R. L. Devaney, *Differential equations, Dynamical Systems, and and introduction to Chaos*, 3rd edition. Academic Press, 2013.
- [2] J. Moser, *Stable and random motions in Dynamical Systems*. Princeton University Press, 1973.