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ESCOLA DE CIÊNCIAS E TECNOLOGIA
DEPARTAMENTO DE MATEMÁTICA

Centro de Investigação em Matemática e Aplicações

Departamento de Matemática

Programa de Doutoramento em Matemática

Seminário

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CLAV - Sala 129 - 12h

Strange attractors near a homoclinic cycle to a bifocus

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Abstract

This seminar is introductory and directed to non-specialists. We explore the three-dimensional chaotic set near a homoclinic cycle to a hyperbolic bifocus at which the vector field has negative divergence. If the invariant manifolds of the bifocus satisfy a non-degeneracy condition, a sequence of hyperbolic suspended horseshoes arises near the cycle, with one expanding and two contracting directions.

We also show that the first return map to a given cross section may be approximated by a map exhibiting heteroclinic tangencies associated to two periodic orbits. When the cycle is broken, the heteroclinic tangencies can be slightly modified in order to satisfy Tatjer's conditions for a generalized

tangency of codimension two. This configuration may be seen as the organizing center, by which one can obtain Bogdanov-Takens bifurcations and therefore, strange attractor and infinitely many sinks.

Keywords: Strange attractors, homoclinic map, hyperbolic bifocus.

Projeto UID/MAT/04674/2019

References

[1] A. A. P. Rodrigues Strange attractors and wandering domains near a homoclinic cycle to a bifocus, *Journal of Differential Equations*, accepted pending minor revisions, 2019