Chaos around a Self-Connection to a T-singularity

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Abstract

This talk is devoted to the analysis of a global connection in $3D$ Filippov systems arising from the communication between the branches of a nonsmooth diabolo of a T-singularity which, under generic conditions, leads the dynamics into a chaotic scenario.

More specifically, we relate crossing orbits of a Filippov system presenting certain crossing self-connections to a T-singularity, with a Smale horseshoe of a first return map associated to the system. The techniques used in this work rely on the detection of transverse intersections between invariant manifolds of a hyperbolic fixed point of saddle type of such a first return map and the analysis of the Smale horseshoe associated to it.

This is a joint work with M. A. Teixeira.