Periodic orbits emanating from a continuum in 3D piecewise-smooth systems

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Abstract. These days, the analysis of continuous piecewise linear systems is enjoying a great popularity because they model real world problems, going from engineering to biology [1]. In this class, the study of periodic orbits usually begins with the analysis of the stability of the equilibria located in the separation boundary of the linearity zones. This analysis is not difficult for planar systems, but the three-dimensional case requires a deeper consideration. Invariant cones play an essential role in this problem [2, 3]. In this talk, we find a homogeneous non-observable system having an invariant cone foliated by periodic orbits and we perform a perturbation to make it observable and non-homogeneous. In the perturbed systems, we prove the existence of periodic orbits that emanate from those of the continuum. This work has been done in collaboration with professors E. Freire and V. Carmona.

References

