

Victoriano Carmona Universidad de Sevilla, Spain

ISOLATED INVARIANT CLOSED CURVES IN PLANAR PIECEWISE LINEAR
SYSTEMS WITH NO SLIDING REGIONS

We study planar piecewise linear differential systems with two zones separated by a straight line, without sliding regions. The flow crosses the separation line transversally, except possibly at one point. It is known that such systems can have at most one limit cycle, which, if it exists, is hyperbolic. Besides limit cycles, these systems may exhibit other isolated non-trivial invariant closed curves, formed by a homoclinic, two heteroclinic connections, or fold-fold connections. We prove the uniqueness of these curves and determine their stability as a simple function of the parameters of the system. This talk is the result of research carried out jointly with Fernando Fernández-Sánchez and Douglas D. Novaes.

This work is partially supported by the Agencia Estatal de Investigación (Spain), through the project PID2024-158381NB-I00 grant.