

RELAY SYSTEMS AND SOME BIFURCATIONS FROM INFINITY

ENRIQUE PONCE

Universidad de Sevilla, Spain
eponcem@us.es

A complete analysis of the limit cycle bifurcation from infinity in 3D Relay systems, which belong to the class of three-dimensional symmetric discontinuous piecewise linear systems with two zones, is presented. A criticality parameter is found, whose sign determines the character of the bifurcation. When such non-degeneracy parameter vanishes, a higher co-dimension bifurcation takes place, giving rise to the emergence of a curve of saddle–node bifurcations of periodic orbits, which allows to determine parameter regions where two limit cycles coexist. The theoretical results are applied to a specific family of 3D relay systems, where several high co-dimension bifurcation points are detected, organizing the bifurcation set of the family.

Joint work by Emilio Freire, E. Ponce, Javier Ros and Elisabet Vela.