

# AN ANALYSIS OF ROUTE TO CHAOS FOR PIECEWISE SMOOTH SYSTEMS SUBMITTED TO NONSMOOTH TRANSITIONS

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## **Abstract :**

In this paper, a mathematical analysis of a possible way to chaos (in the sense of Li and Yorke) for bounded piecewise smooth systems of dimension three submitted to nonsmooth transitions is proposed. This study is based on period doubling method applied to the related Poincaré map defined on a Poincaré section chosen in the neighborhood of the bifurcation point and transverse to the switching manifold. This choice permits us to reduce the corresponding discrete system to dimension one and allows us to apply "period three implies chaos".

**Keywords :** Dynamic bifurcations; chaotic behavior; bifurcation of limit cycles and periodic orbits; bifurcations connected with nontransversal intersection.

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