
A dynamical systems approach to singularities

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Abstract

One way to approach the study of a singularity is to view it as an attractor (equilibrium point, limit cycle, etc) in an infinite dimensional dynamical system. Such point of view has been the key for the understanding of various problems in fluid mechanics in the recent years. Examples are the disconnection of bubbles and the formation of cascades of satellite drops in thin film and jets breakup. This provides both interesting experimental realizations of complex behaviours for the solutions of nonlinear PDEs and a tentative way to classify singularities. We will present an overview by means of mathematical models of various physical systems and compare the result of their mathematical analysis with the observed experimental behaviour.

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