



## HYBRID SYSTEM DYNAMICS

*Invited Lecture*

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**ABSTRACT:** A survey as review of author's research results in area of Dynamics of Hybrid Systems are presented (see Refs. [1-5]).

The interest in the study of coupled systems as new qualitative systems has grown exponentially over the last few years because of the theoretical challenges involved in the investigation of such systems. If these systems contain coupled subsystems with different coupled fields and different disparate natures we can generalize that words are about hybrid systems with coupled fields disparate natures and with subsystems with continuous or discrete properties. Also, we can conclude that the impact on applications in several disciplines and industrial contexts increase. At a conceptual level, scientists identify computational systems with processing software tools of the available information.

Recent technological innovations have caused a considerable interest in the study of dynamical processes of heterogeneous continuous and discrete nature, denoted as hybrid systems, characterized by the interaction of continuous time models, governed by partial differential equations, and of ordinary differential equations. Previous partial differential equations are with boundary and initial conditions, and ordinary differential equations only with initial conditions and both are with coefficients with coupled properties.

Coupled systems switch between many operating modes where each mode is governed by its own characteristic dynamical laws. The scientific literature of coupled systems with coupled disparate nature fields covers almost all branches of science.

**Key words:** Coupled subsystems, coupled dynamics, hybrid, multi frequency, energy transfer, coupled singularities, trigger.

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