# Research Report ছ

# THE STUDY OF HAMILTON-POISSON SYSTEMS AND THEIR INTEGRABLE DEFORMATIONS USING THE ENERGY-CASIMIR MAPPING

# Goal of the project

The study of the Hamilton-Poisson systems by using the associated energy-Casimir mapping.
The study of changes in the behavior of dynamical systems by using some integrable deformations.

# Short description of the project

We study the connections between the dynamics of Hamilton-Poisson systems and the corresponding energy-Casimir mapping.

We also consider integrable deformations of known dynamical systems.

# Implementation period

21.11.2017 - 31.12.2018

#### Budget

46.500 RON (10000 EUR)

#### Main activities

- The study of some integrable deformations of relevant dynamical systems
- The study of the energy-Casimir mapping with polynomial and non-polynomial components
- The study of some general results of the integrable deformations of the three-dimensional Hamilton-Poisson systems

• The study of the connections between the partition of the image of the energy–Casimir mapping and types of orbits

#### Results

- 2 papers published in ISI journals
- 1. "Integrable Deformations of Three–Dimensional Chaotic Systems", Lăzureanu, C., INTERNATIONAL JOURNAL OF BIFURCATION AND CHAOS, Volume: 28, Issue: 5, (2018)
- 2. "Stability and Energy-Casimir Mapping for Integrable Deformations of the Kermack-McKendrick System", Lăzureanu, C., Petrișor, C., ADVANCES IN MATHEMATICAL PHYSICS, Volume 2018, (2018).

#### Results

- 3 communications / submitted papers (ISI Conferences)
- 1. "Stability and some special orbits for an integrable deformation of the Rikitake system", Lăzureanu, C., Hedrea, C., Petrișor, C., International Conference ICAMCS 2018, Paris, France.
- "On the integrable deformations of a system related to the motion of two vortices in an ideal incompressible fluid", Lăzureanu, C., Hedrea, C., Petrişor, C., International Conference ICCMAE 2018, Timişoara.
- "Chaotic Behavior of an Integrable Deformation of a Nonlinear Monetary System", autor: Lăzureanu, C., International Conference ICNAAM 2018, Rodos, Greece.
- 2 communications / submitted papers (BDI Conferences)
- 1. "On a deformed version of the T system", autori: Lăzureanu, C., Căplescu, C., International Conference ICMA 2018, Timișoara.
- 2. "On the dynamics of a Hamilton-Poisson system", Lăzureanu, C., Petrișor, C., International Conference ICMA 2018, Timișoara.

#### Research team

Cristian–Virgil LĂZUREANU, Project Director Ciprian HEDREA, Member Camelia PETRIȘOR, Member

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