

# Chaos and Stabilizing Mechanisms for Yang-Mills Mechanical Models

Radu Constantinescu and Carmen Ionescu  
Dept. of Theoretical Physics,  
University of Craiova, 13 A. I. Cuza Str., 200585, Craiova, Romania

## Abstract

The paper intends to present how gauge field theories in mechanical context can be assimilated with problems of controlling the chaotic evolution of nonlinear dynamical systems. The free Yang-Mills model is used as a model and the ghost field appearing in the  $sp(2)$  BRST approach are used as control parameters. Numerical computations evidence the existence of a critic value of the control parameter for the passage from the chaos to regular dynamics. The stabilizing mechanism is similar with Higgs mechanism and mass generation in Quark Gluon Plasma.

**Key words:** Yang-Mills model, Quark Gluon Plasma, Higgs mechanism

**Pacs:** 11.10.Ef, 05.45.-a