

# ICRAMCS 2026

THE EIGHTH EDITION OF THE INTERNATIONAL CONFERENCE ON  
RESEARCH IN APPLIED MATHEMATICS AND COMPUTER SCIENCE  
April 23-24-25, 2026 | Marrakech, Morocco



## Dynamical analysis of a 5D porous model

### Communication Info

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#### Keywords:

(1) Spectral method  
(2) Chaos  
(3) Hopf bifurcation

### Abstract

This paper examines the transition to chaos in a five-dimensional model of low Prandtl number convection in a porous medium. The governing equations, based on the Boussinesq-Darcy approximation, are reduced using a spectral method and solved numerically via a fourth-order Runge-Kutta scheme [1]. Results show that beyond a subcritical Rayleigh number, steady convection transitions to chaos through a Hopf bifurcation, producing a limit cycle associated with a homoclinic explosion [2]- [3]. Additionally, for specific parameter values, periodic oscillatory convection transitions to chaos via a period-doubling cascade [4].

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