Eugene Wigner Colloquium

joint event of GRK 1558 and SFB 910

SFB 910

Prof. Gérard Degan

Université Nationale des Sciences, Technologies, Ingénierie et Mathématiques (UNSTIM), Benin

"Non-linear and linear stability analysis of a Maxwell-Jeffrey fluid in a rotating anisotropic porous layer with oblique principal axes"

The problem solved in the study concerns the non-linear stability analysis of convection in a rotating anisotropic porous heated from below. For the accurate modeling of the anisotropic porous matrix, both mechanical anisotropy about the rotating axis in the vertical direction and hydrodynamical anisotropy prevailing in the horizontal plane whose principal axes oriented in a direction non-coincident with the gravity force are considered. On the basis of the generalized Darcy's law and the modified Darcy-Maxwell-Jeffrey model employed to take into account the properties of the viscoelastistic fluid saturating the porous matrix and to include the time derivate and Coriolis terms, an unsteady non-linear analysis based on minimal representation of the truncated Fourier series analysis has been conducted to solve numerically the finite amplitude equations. Moreover, the linear stability theory related to the normal mode method has been followed. The rotating inhibits the onset of convection in both stationary and oscillatory mode. It has been demonstrated that each parameter involved in the present analysis has an important effect on the physical system considered.

GRK1558 research training group

Thursday, 26.10.17 · 16:15h · EW 202

Technische Universität Berlin · Institut für Theoretische Physik · Hardenbergstraße 36 · 10623 Berlin
www.itp.tu-berlin.de/grk1558 · www.itp.tu-berlin.de/sfb910