Abstract Submitted
for the DFD05 Meeting of
The American Physical Society

Flow bifurcations in a cubical cavity heated from below at Pr = 130 DOLORS PUIGJANER, Dept. Enginyeria Informàtica i Matemàtiques, Universitat Rovira i Virgili, Tarragona, Catalunya, Spain, JOAN HERRERO, FRANCESC GIRALT, Dept. Enginyeria Química, Universitat Rovira i Virgili, Tarragona, Catalunya, Spain, CARLES SIMO, Departament d'Matemàtica Aplicada i Anàlisi, Universitat de Barcelona, Barcelona, Catalunya, Spain — Bifurcation diagrams of steady convective flow patterns inside a cubical cavity heated from below and filled with silicone oil (Pr = 130) were determined for adiabatic and perfectly conducting lateral walls. The diagrams were obtained for Rayleigh numbers up to 1.5 10^5 by means of a parameter continuation procedure based on the Galerkin spectral method. A complete set of basis functions satisfying implicitly all boundary conditions and the continuity equation was used to expand the velocity and the temperature fields. Present results are in agreement with experimental PIV data and visualizations previously reported in the literature for both adiabatic and perfectly conducting lateral walls boundary conditions.

Francesc Giralt
Dept. Enginyeria Química, Universitat Rovira i Virgili
Tarragona, Catalunya

Date submitted: 04 Aug 2005 Electronic form version 1.4