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Rayleigh Bénard Convection-A Case Study on Pattern Formation

HIRA SIDDIQUI, RUDOLF FRIEDRICH, WWU Muenster, Germany — Spiral turbulence in Rayleigh-Benard convection is studied numerically in the framework of generalized Swift Hohenberg equations. The model equation consist of an order parameter equation for the temperature field coupled to an equation for the mean flow field. In contrast to the earlier work, nonlinearities in the dynamics of the mean flow are retained leading to a two dimensional Navier-Stokes equation coupled to a Swift-Hohenberg equation. We present the numerical investigations of nonlinear effects due to the interaction of nonlinear two dimensional flows and the pattern forming process.

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