

Abstract Submitted
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Particle Tracking in Rotating Rayleigh-Benard Convection

JANET SCHEEL, California Institute of Technology, PAUL FISCHER, Argonne National Laboratory — Aref [J. Fluid Mech., 1984] developed the concept of chaotic advection by utilizing the fact that real space is phase space for a two-dimensional fluid. This analysis is extended to investigate large aspect ratio, 3-D rotating Rayleigh-Benard convection with no-slip boundary conditions. Numerical results for the real space evolution of tracer particles provides us with a means to study the transition to the domain chaos state. The idealized domain chaos state is characterized by a steady Koppers-Lortz switching from a set of rolls with one orientation to a set of rolls in a different orientation. This system is compared and contrasted with the blinking roll model of chaotic advection presented by Mullowney et. al. [SIAM Applied Dynamical Systems, 2005].

Janet Scheel
California Institute of Technology

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