Abstract Submitted
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**Prandtl effects on mixing in nonlinear spinup**[1] MELINE BAGHDASARIAN, ARTURO PACHECO-VEGA, Cal State Univ- Los Angeles, J. RAFAEL PACHECO, SAP Americas, ROBERTO VERZICCO, Universita di Roma "Tor Vergata" — Stratified spin-up experiments in enclosed cylinders have reported the presence of small pockets of well-mixed fluids; however, there have been shortfalls in terms of quantitative accounts of the mixedness of the fluid. Previous numerical studies reported in the literature have not been able to quantify these measurements either. Here we present a series of three-dimensional numerical simulations that address how the combined effect of spin-up and thermal boundary conditions for various Prandtl numbers enhances or hinders mixing of a fluid in a cylinder. Measurements of efficiency of mixing are based on the variance of temperature and explained in terms of the potential energy available. The numerical simulations of the Navier–Stokes equations for the problem with different sets of thermal boundary conditions at the horizontal walls and varying Prandtl number reported here have helped shed some light on the physical mechanisms of mixing, for which a clear explanation was lacking.

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