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Sustained shear flows in Rayleigh-Bnard convection TAYLER QUIST, EVAN ANDERS, BENJAMIN BROWN, University of Colorado, JEFFREY OISHI, Bates College — Zonal shear flows play important roles in both the solar and geo dynamos. In two dimensional simulations, and at relatively narrow aspect ratios, Rayleigh-Bnard convection naturally achieves zonal shear flows. These zonal flows are driven by the convection and modify it, significantly altering the heat transport and convective structures. Here we study shear flows in two and three-dimensional simulations of Rayleigh-Bnard convection using the Dedalus pseudospectral framework. At small aspect ratios and at Prandtl number 1, a large horizontal shear naturally occurs. At larger aspect ratios, we find that shearing is naturally prevented unless manually induced; there is a bistability between states dominated by flywheel modes and states dominated by large scale shear. We explore these states and the possibilities of sustained large scale shear in 3-D simulations.

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