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Sustained shear flows in stratified convection EVAN ANDERS, TAYLER QUIST, BENJAMIN BROWN, University of Colorado - Boulder, JEFFREY OISHI, Bates College — Highly stratified convection is ubiquitous among natural systems including planetary atmospheres and stellar envelopes. Here we study fully compressible convection within plane-parallel, polytropically stratified layers using the Dedalus pseudospectral framework at moderate to high Rayleigh number. We find that large scale shearing "zonal" flows can naturally arise in such systems, as previously found in incompressible Rayleigh-Benard convection. These zonal winds can strongly influence the dynamics of convection. We study the forces that drive and dissipate large-scale shear flows and the bulk properties of sustained flows. We find naturally occurring shear flows at moderate aspect ratio and explore methods to achieve similar, convectively-driven shear flows at larger aspect ratios.

Evan Anders
University of Colorado - Boulder

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