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Stressed Horizontal Convection KATARZYNA MATUSIK, STEFAN LLEWELLYN SMITH, UCSD Mechanical & Aerospace Engineering Dept. — We present experiments aimed at elucidating the interaction between wind-induced surface shear and the meridional overturning circulation. The effect of a shear stress on convection driven by a maintained dense source entering a homogeneous environment is explored. A saline plume enters a confined fresh-water environment at a boundary along with which a constant shear stress is being applied simultaneously. The system is driven to a statistically steady state, and the resulting density and velocity fields are obtained by Synthetic Schlieren and PIV techniques, respectively. The magnitude and direction of the shear stress is varied between experiments, as well as the density of the plume. Results indicate that there exists a competitive regime between the buoyancy and mechanical forcing, resulting in marked variations in flow features such as the interior stratification and boundary layer thickness, among others.

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