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**Experiments on horizontal convection at high Rayleigh and Prandtl numbers.**[1] PIERRE-YVES PASSAGGIA, ALBERTO SCOTTI, BRIAN WHITE, Department of Marine Sciences, University of North Carolina, Chapel Hill, NC 27599, USA — Horizontal convection is a flow driven by a differential buoyancy forcing across a horizontal surface. It has been considered as a simple model to study the influence of heating, cooling and fresh water fluxes at the ocean surface on the meridional overturning circulation. In order to investigate the flow properties and energetics of horizontal convection at high Prandtl numbers, the flow is driven by the diffusion of salt in water across membranes localized at the surface. The resulting experiments are examined for a Prandtl number $\mathrm{Pr} \approx 500$ and Rayleigh numbers up to $\mathrm{Ra} \approx 10^{16}$. Time resolved particle image velocimetry is performed together with with planar laser induced fluorescence. To quantify the salt concentration and therefore the density of the fluid, sodium bisulfate is added to the salt water to decrease its pH of and thereby reduce the emission rate of the fluorescein dye. Rhodamine WT, insensitive to pH variations, is also introduced to correct for the spatial nonuniformity of the intensity of the laser sheet, a technique also known as ratiometric PLIF (Coppeta & Rogers, 1998). The local turbulent energetics are finally investigated using the local approach to available potential energy of Scotti & White (2014).

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