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Turbulent transport of a high Schmidt number passive scalar below an air–water interface with zero mean shear[1] EVAN VARIANO, UC Berkeley, EDWIN COWEN, Cornell University — Laboratory measurements in a stirred tank reveal the turbulent flux on the water side of an air–water interface. The tank is stirred from below by random jets, providing turbulence that is homogeneous and isotropic in the horizontal direction. This flow is an interesting counterpoint to cases where the turbulence at the surface is driven by shear there. The Taylor microscale Reynolds number $R_\lambda \approx 300$, giving a wide range of scales. The contribution of these various scales to turbulent scalar flux is investigated by simultaneously measuring the velocity field and the concentration field of dissolved CO_2. This is accomplished via quantitative imaging, and allows cospectra, structure functions, and coherent structures to be investigated. These are compared to theory for sheared interfaces, as well as to similar results obtained by other researchers at lower Schmidt and Reynolds numbers via CFD.

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