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Interfacial instabilities and turbulent plasma mixing in the lab and in geospace[1] MARK KOEPKE, S.H. NOGAMI, V. DEMIDOV, West Virginia Univ, K. GENTLE, Univ Texas - Austin — Lab and space examples of turbulent instability, growth, and mixing covering a rest-frame frequency range from zero-frequency to lower-hybrid frequency have been benchmarked by laboratory experiments and applied to interpretations of space observations, as reviewed here. Local and nonlocal models of shear-driven D'Angelo, Kelvin–Helmholtz, ion-cyclotron, and lower-hybrid modes guide the laboratory explorations and predict that ion-acoustic, drift, and ion-cyclotron wave turbulence is significantly modified by velocity shear. Experimental efforts to identify mechanism by which turbulent mixing is suppressed in toroidal confinement devices when a radial electric field is externally applied suggest that the interaction between velocity shear and turbulent fluctuations include linear and nonlinear coupling between fluctuations and flows, mode coupling with a stable or damped mode, and changes in phase relationship between density and potential fluctuations.

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Mark Koepke
West Virginia University

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