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Intermittency in Stratified Turbulence Produced by Breaking Internal Gravity Waves

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Internal gravity waves nonlinear interactions lead to intermittent breaking events with density overturning and vertical turbulent mixing. We analyze the statistics of density and velocity fluctuations in this process, using direct numerical simulations. We characterize the density and velocity gradients at different scales along the vertical direction. The velocity gradients behave in a very similar way to usual turbulence, while the density gradients are very intermittent. This can be attributed to the formation of sheets with strong stable density gradients. Unstable density gradients are rare and form intermittent patches of different scale for which we have analyzed the statistics. We discuss the link with mixing properties of the internal wave field and compare with observations in the ocean and the atmosphere.

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