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Kelvin-Helmholtz instability: the "atom" of geophysical turbulence? WILLIAM SMYTH, Oregon State University — Observations of small-scale turbulence in Earth's atmosphere and oceans have most commonly been interpreted in terms of the Kolmogorov theory of isotropic turbulence, despite the fact that the observed turbulence is significantly anisotropic due to density stratification and sheared large-scale flows. I will describe an alternative picture in which turbulence consists of distinct events that occur sporadically in space and time. The simplest model for an individual event is the "Kelvin-Helmholtz (KH) ansatz", in which turbulence relieves the dynamic instability of a localized shear layer. I will summarize evidence that the KH ansatz is a valid description of observed turbulence events, using microstructure measurements from the equatorial Pacific ocean as an example. While the KH ansatz has been under study for many decades and is reasonably well understood, the bigger picture is much less clear. How are the KH events distributed in space and time? How do different events interact with each other? I will describe some tentative steps toward a more thorough understanding.

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