

Wave-induced Turbulence in the Lower Troposphere: A T-REX Perspective

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Elevated turbulence in the lower troposphere is often terrain-induced. One of the most severe terrain-induced atmospheric phenomena is an atmospheric rotor, traditionally depicted as an anisotropic vortex below lee wave crests on the downwind side of a generating mountain range. Known for high-turbulence levels, rotors pose a known hazard to aviation and have been cited in many aircraft incidents and accidents. The Terrain-induced Rotor Experiment (T-REX), a large field campaign and research effort, has been undertaken recently (2006) to obtain high-resolution observations of this and related complex-terrain phenomena that could be used also to verify recent numerical simulations, which indicate that concentrated vorticity in the atmospheric rotor results from the wave-induced boundary-layer separation with enhanced turbulence resulting from shearing instability of the elevated vortex sheet. In this talk, we will present analysis of lower tropospheric turbulence zones based on the T-REX observations, focusing primarily on high-resolution aircraft and radiosonde data.