ATS/CIRA Colloquium

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Terrain-induced Rotor Experiment: New Insights into Lee Waves and Atmospheric Rotors

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ATS room 101; Discussion will begin at 3:30pm
Refreshments will be served at 3:00pm in the coffee lounge

Atmospheric rotors are three-dimensional anisotropic atmospheric vortices that form parallel to and downwind of a mountain crest under conditions conducive to generation of large-amplitude lee waves. Intermittency, high-levels of turbulence, and complex small-scale internal structure are defining characteristics of rotors, which pose a known hazard to aviation. The central objective of the Terrain-induced Rotor Experiment (T-REX, March-April 2006, Sierra Nevada, CA) was to provide a comprehensive set of in situ and remotely-sensed meteorological observations from the ground to the upper tropospheric-lower stratospheric altitudes for the documentation of spatiotemporal characteristics of a tightly coupled system, consisting of an atmospheric rotor, terrain-induced internal gravity waves, and a complex-terrain boundary layer. Along with a concise overview of the entire project, presented will be new insights into the structure of atmospheric rotors and their relation to atmospheric lee waves that have emerged from our T-REX observational analyses to date and the related real-data and idealized numerical modeling studies of lee waves and, more generally, flow over complex terrain.