



Lower-tropospheric waves and wave-induced turbulence zones: Insights from T-REX

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During the Terrain-induced Rotor Experiment (T-REX) in March/April 2006 highly turbulent flows in the lee of the Sierra Nevada were probed by the University of Wyoming King Air (UWKA) aircraft. In situ thermodynamic and kinematic data was obtained by UWKA on rotor and wave structures over Owens Valley in a number of research missions under strong lee-wave conditions. In situ measurements by the UWKA have been used to examine strongly turbulent flow regions documented by the UWKA and their relationship to the flow structures over Owens Valley. Wave-induced pressure perturbations determined from the aircraft measurements are compared with the surface pressure perturbations derived from the network of surface pressure sensors in Owens Valley in order to detect wave-induced boundary-layer separation.

Sufficiently strong signal returns from the Wyoming Cloud Radar (WCR) were granted by the presence of ice particles within different types of clouds associated with the wave/rotor system, including mountain cap clouds over the Sierra crest, spill overclouds over the eastern Sierra slopes and in a few events rotor clouds over Owens Valley. The results of the dual-Doppler analyses for the rotor clouds reveal the presence of fine-scale structures within the roll clouds in the upper part of the rotor circulation.