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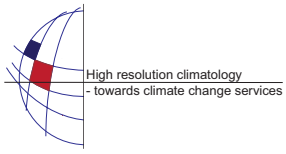

Downslope windstorms and gap winds during T-REX

G. J. Mayr (1) and L. Armi (2)

(1) University of Innsbruck, Meteorology and Geophysics, Innsbruck, Austria (georg.mayr@uibk.ac.at), (2) Scripps Institution of Oceanography, La Jolla, CA 92093-0225, USA

Downslope windstorms, gap flows and foehn are ubiquituous in all mountainous areas of the world. The large observational database from the 2006 T-REX campaign is used to trace their manifestation downstream of the Sierra Nevada, California.

How a stably stratified airmass upstream of the Sierra Nevada can descend as foehn into the nearly 3 km deep Owens Valley will be studied for three different cases. The simplest one is a gap flow case: While upstream conditions remained fairly stationary, strong diurnal heating on the downstream side warmed the valley air mass sufficiently to permit flow through the passes to descend to the valley floor only in the late afternoon. Potential temperatures of air crossing the crest were too warm to descend past a virtual floor formed by the strong potential temperature step at the top of the valley air mass, the height of which changed throughout the day primarily due to diurnal heating in the valley.

The second case had flow descending into the valley not only through the passes but also across the crest; a situation referred to as downslope windstorm or alternatively as deep foehn.

The third case was the most complicated one with four distinct layers involved.

The results from the T-REX campaign will be compared with those from the Mesocale Alpine Programme.