

Airborne DWL/WRF model investigation of flow over complex terrain (MATERHORN 2012). G. D. Emmitt, S. Greco, K. Godwin, Simpson Weather Associates, Inc. (USA); and S. de Wekker, University of Virginia (USA).

ABSTRACT

In October 2012, a multi agency experiment (MATERHORN) was conducted on the Dugway Proving Grounds in Utah. A primary objective of the field campaign was to validate numerical model predictions of atmospheric circulations and energy fluxes in mountainous terrain. A 2um coherent airborne DWL was used to obtain wind and aerosol profiles within a 20km x 20km x 2 km domain. Over a period of two weeks, more than 3000 profiles with 50m vertical resolution were recorded. These profiles are being used to validate the WRF model and to eventually guide the modification of the boundary layer parameterization.

This paper will describe the airborne Twin Otter Doppler Wind Lidar (TODWL) system and present a series of model and lidar wind profiles highlighting the areas and situations that have become the foci of our research. An additional example of making measurements of mountain waves using three differing perspectives (off-nadir conical scans, nadir stares and forward stares) will be discussed.