



A large amplitude orographic wave event - measurements vs ECMWF

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During the DEEPWAVE campaign a large amplitude orographic wave event occurred over New Zealand around 1st of August 2014. This event was recorded in the troposphere, stratosphere and mesosphere by a ground-based Rayleigh lidar and radiosoundings on the leeward side of the mountains.

The presented case is characterized by an intense cross mountain flow over the Southern Alps of New Zealand, which excited the large amplitude mountain waves. The interaction of both the polar jet and the subtropical jet created a unique meteorological condition which allowed for an almost unhindered propagation of the mountain waves into the stratosphere. Resulting in the largest stratospheric gravity wave response observed during the DEEPWAVE campaign. In the upper stratosphere wave breaking was observed.

We assess the validity of ECMWF IFS (integrated forecast system) analyses and forecasts during this event by comparing the ECMWF data to the ground-based lidar, radiosonde and satellite measurements as well as mesoscale simulations conducted with the WRF model. In this study, a detailed focus is put on the gravity waves resolved by ECMWF.