

Characterisation of mountain waves in the tropopause region using MTP measurements

Mareike KENNTNER¹, Julie HAGGERTY²

¹ *Deutsches Zentrum für Luft- und Raumfahrt, Institut für Physik der Atmosphäre, Oberpfaffenhofen, Germany*

² *National Center for Atmospheric Research, Boulder, Colorado, U.S.A.*

The Microwave Temperature Profiler (MTP), originally developed by NASA's Jet Propulsion Laboratory, is a passive radiometer measuring atmospheric temperatures. It is mounted beneath the wing of a research aircraft, providing temperature profile data both, above and below flight level. A new algorithm for analysis of the temperature profiles derived from MTP measurements has been developed. This algorithm is used to evaluate MTP measurements from the DEEPWAVE (Deep Propagating Gravity Wave Experiment over New Zealand) campaign, which took place in New Zealand in 2014.

The analysis of MTP data shows where gravity wave activity is located along the flight track of the research aircraft. Furthermore, the new analysis tool provides an overview of the atmospheric state and propagating conditions around flight altitude, derived from the data provided by the MTP. The evaluation of MTP data with this new algorithm leads to an indication where transport of momentum and energy into the stratosphere is possible.

Here, the new analysis algorithm is presented, and examples of the evaluation of MTP data from the DEEPWAVE campaign will be shown. These examples show that measurements by the MTP instrument provide a unique and important insight to the prevailing conditions of wave propagation through the tropopause region.

Key words: Microwave remote sensing, Tropopause, UTLS, Mountain waves