



Gravity Wave Reflection: a Case Study based on Rocket Data

S. Wüst and M. Bittner

German Remote Sensing Data Center (DFD), German Aerospace Center (DLR), Oberpfaffenhofen, Germany
(sabine.wuest@dlr.de; michael.bittner@dlr.de)

Since gravity waves have significant influence on the atmosphere by transporting energy and momentum, it is important to study their wave spectrum and their energy dissipation rates. Besides that, knowledge about the gravity wave sources and the propagation of the generated waves is essential. Originated in the lower atmosphere gravity waves can move upwards; when the background wind field is equal to their phase speed a so-called critical layer is reached which can result in breaking down and deposition of energy and momentum. Another mechanism which can take place at critical layers is gravity wave reflection.

Gravity waves which were observed by foil-chaff measurements during the DYANA campaign (DYnamics Adapted Network for the Atmosphere) in 1990 in Biscarrosse (44°N, 1°E) - as reported by Wüst and Bittner (2006) - are investigated regarding the effect of possible wave reflection. Therefore it is required to analyse the phase speeds of the waves and the height of the critical layers of the background wind field. Additionally, energy dissipation rates are calculated and compared to the critical layers. Gravity wave reflection is possible and evidence for an atmospheric wave guide is given.