

## **Winds and temperatures in the stratosphere and mesosphere at ALOMAR derived by Doppler lidar**

Jens Hildebrand, Gerd Baumgarten, Jens Fiedler, and Franz-Josef Lübken

Leibniz-Institute of Atmospheric Physics, Kuehlungsborn, Germany (hildebrand@iap-kborn.de)

Wind and temperature measurements in the middle atmosphere are crucial for a comprehensive understanding of atmospheric dynamics. Unfortunately, they are very challenging, especially with vertical and temporal resolutions reasonable for gravity-wave studies. The Doppler Rayleigh Iodine Spectrometer (DoRIS) of the Rayleigh/Mie/Raman lidar at the Arctic station ALOMAR in Northern Norway (69°N, 16°E) is the only remote sensing instrument that simultaneously derives temperatures and two wind components in the entire stratosphere and mesosphere, even under daylight conditions, necessarily for long-duration gravity-wave studies. The temporal and vertical resolutions are, typically, 1 h and 3 km, respectively. We are going to present case studies of middle atmospheric winds and temperatures, obtained during winter seasons 2010 – 2015.

During a sounding rocket campaign in March 2015 an extensive salvo of meteorological rockets for in-situ wind measurements was launched at the Andøya Space Center close to ALOMAR. This gave the opportunity for a comprehensive comparison of winds derived by lidar and in-situ observations in the middle atmosphere, whose results we will present.