



## **Radiation profiles measured through clouds using a return glider radiosonde**

Andreas Kräuchi (1), Rolf Philipona (2), and Rigel Kivi (3)

(1) Institute for Atmospheric and Climate Science, ETH Zurich, CH-8057 Zurich, Switzerland, (2) Federal Office of Meteorology and Climatology MeteoSwiss, CH-1530 Payerne, Switzerland, (3) Finnish Meteorological Institute, Arctic Research, 99600 Sodankylä, Finland

With new and improved radiation sensors in a small glider aircraft vertical flights through clouds have been conducted. This new Return Glider Radiosonde (RG-R) is lifted up with double balloon technique to keep the radiation instruments as horizontal as possible during ascent. The RG-R is equipped with a routine radiosonde to transmit the data to a ground station and an autopilot to fly the glider radiosonde back to the launch site, where it lands autonomous with a parachute. The RG-R was successfully tested and deployed for tropospheric and stratospheric radiation measurements up to 30 hPa (24 km altitude) at the GRUAN sites Payerne (Switzerland) and Sodankylä (Finland). Radiation profiles and the radiation budget through the atmosphere during different daytimes and under cloud-free and cloudy situations will be shown in relation to temperature and humidity at the surface and in the atmosphere. The RG-R flight characteristics and new measurement possibilities will also be discussed.