

A new state-of-the-art Temperature and Humidity Lidar

Ludwig Wagner (2) and George Georgoussis (1)

(1) GWU-Umwelttechnik GmbH, Meteorology, Erfstadt, Germany (ludwig.wagner@gwu-group.de), (2) Raymetrics S.A. Spartis 32, Fil. Eterias, Metamorfofis GR-144 52, Athens, Greece

Accurate profiling of atmospheric temperature and humidity is a prerequisite for many meteorological studies, including nowcasting, model evaluation, and assimilation. Unfortunately, existing instrumentation lacks either the temporal or vertical resolution required for such application. To fill this gap, Raymetrics S.A., a global leader in lidar (lidar detection and ranging) technology, is developing a new state-of-the-art temperature and humidity lidar instrument Night Time & Day Time Operation. Based on the lidar technique the new product can provide measurements of temperature and humidity from near the ground up to few kilometers, with vertical resolution down to few meters and time of the order of few seconds. The measurements are based on accurate observation of spectral signature of atmospheric molecules and their changes with ambient temperature. The new system integrates findings from leading research institutes developed during the final decade, into robust and reliable lidar that can cover requirements for a wide range of application. The system can be optimized either for Planetary Boundary Layer (PBL) monitoring, or observation in the middle and upper troposphere. The interpretations of the data are done using proprietary algorithms that exploit the full information content on the measurements, delivering consistently better results than even state-of-the-art retrieval techniques.