



## NDACC Lidar Validation Activities in Europe

**Robin Wing**<sup>1</sup>, Wolfgang Steinbrecht<sup>2</sup>, Sophie Godin-Beekmann<sup>1</sup>, Thomas J. McGee<sup>3</sup>, John Sullivan<sup>3</sup>, Grant Sumnicht<sup>3</sup>, Gérard Ancellet<sup>1</sup>, Alain Hauchecorne<sup>1</sup>, Sergey Khaykin<sup>1</sup>, and Philippe Keckhut<sup>1</sup>

<sup>1</sup>LATMOS/IPSL, OVSQ, Sorbonne Universités, CNRS, Paris, France (robin.wing@latmos.ipsl.fr)

<sup>2</sup>Deutscher Wetterdienst, Met. Obs. Hohenpeißenberg, Hohenpeißenberg, Germany

<sup>3</sup>NASA Goddard Space Flight Center, Greenbelt, Maryland

Recent intercomparison exercises have been conducted at two European NDACC lidar sites. The mobile NASA Stratospheric Ozone Lidar (NASA STROZ) was present for a two part validation campaign at the Observatoire de Haute-Provence (43.93 N, 5.71 E) in July 2017 and March 2018 and at the Hohenpeißenberg Meteorological Observatory (47.80 N, 11.00 E) in March 2019. Lidar profiles of ozone and temperature were compared with local radiosondes and ozonesondes; satellite profiles from local overpasses of Sounding of the Atmosphere by Broadband Emission Radiometry instrument (SABER) and Microwave Limb Sounder (MLS); and NCEP reanalysis. There is overall good agreement between all the lidar instruments and the balloon measurements, particularly in the reproduction of small scale features, during all three phases of the European campaign.

We have conducted a detailed correlational study of all instruments involved in the campaign and have rigorously evaluated the uncertainty budget of each instrument. We will discuss the strengths and drawbacks of different statistical techniques for evaluating coincident ozone and temperature measurements and compare how our estimates of instrument uncertainty compare to the observed variance in the data.