

File Revision Date:

October 10, 2017

Data Set Description:

PI: Richard Querel
Instrument: Stratospheric Ozone LIDAR
Site(s): Lauder, New Zealand (-45.038, 169.684)
Measurement Quantities: Ozone

Contact Information:

Name: Richard Querel
Address: Private Bag 50061, Omakau, Central Otago 9352, New Zealand
Phone: +64 3 440 0400
Email: richard.querel@niwa.co.nz

Reference Articles:

Swart, Daan P.J., Jan Spakman, Hans B. Bergwerff: RIVM's Stratospheric Ozone Lidar for NDSC Station Lauder: System Description and First Results. Abstracts of Papers of the 17th International Laser Radar Conference, Sendai, Japan, 1994, 405–408

Brinksma E.J., Swart D.P.J., Bergwerff J.B., Meijer Y.J., Ormel F.T. (1997) RIVM Stratospheric Ozone Lidar at NDSC Station Lauder: Routine Measurements and Validation During the OPAL Campaign. In: Ansmann A., Neuber R., Rairoux P., Wandinger U. (eds) Advances in Atmospheric Remote Sensing with Lidar. Springer, Berlin, Heidelberg

McDermid, I. S., et al. (1998), OPAL: Network for the Detection of Stratospheric Change ozone profiler assessment at Lauder, New Zealand 2. Intercomparison of revised results, *J. Geophys. Res.*, 103(D22), 28693–28699, doi:10.1029/98JD02707.

Instrument Description:

The RIVM stratospheric lidar is a differential absorption lidar (DIAL). Since September 2007, it has a Coherent LPXPro 325C XeCl excimer laser, predominantly emitting light pulses in the wavelength 308 nm. A secondary beam (at 353 nm) is generated through Raman conversion. Subsequently, the system measures the backscatter in these two wavelengths (both measured in near -5% intensity- and far -95% intensity- channels) and at 332 and 385 nm (Raman channels).

Measurements prior to July 2011 were taken in four modes. Distinction between these modes is done using grey filters (see Table 1 for an overview of the used channels). The modes are:

1. nd05 used when clouds are present
2. nd20 used in clear sky conditions
3. mid
4. high

The first measurement is the mid-measurement, with which it is possible to derive an ozone profile from 28 up to 40-45 km. The nd05 and nd20 measurements allow a good characterisation of the lower profile

(both using Raman channels). Finally, the last measurement (high) is used to better capture the part of the profile above the aerosol layer (>28 km, therefore Raman channels are not needed).

Four wavelengths can be used, where the signal of 308 nm and 353 nm can be split into near and far signal segments to reduce the large dynamic range of the return signal.

Algorithm Description:

Expected Precision/Accuracy of Instrument:

Instrument History:

1994 - Measurements began at Lauder

2007 - Laser replaced