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

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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:
RIVM originally installed the differential absorption lidar (DIAL) ozone lidar in 1992. The XeCl excimer emits 308 nm. A secondary beam (at 353 nm) is generated through Raman conversion in an H2 cell. The system measures backscatter at these two wavelengths (both measured in near -5% intensity- and far -95% intensity- channels) and at 332 and 385 nm (Raman channels).

For most of the timeseries, measurements were made in four modes. Distinction between these modes is done using grey filters. 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 for 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 – Excimer replaced
2021 (July) – Excimer failed