

File Revision Date:

September 9, 1999

Data Set Description:

PI: Roland Neuber
Instrument: Stratospheric Aerosol Lidar
Site(s): Koldewey-Station, Ny-Alesund
Measurement Quantities: temperature profile from air density profile

Contact Information:

Name: Roland Neuber
Address: Alfred Wegener Institute for Polar and Marine Research
Research Department Potsdam
Telegrafenberg A43
Postfach 600 149
D-14401 Potsdam, German
Phone: +49-331-288-2129
FAX: +49-331-288-2178
Email: neuber@awi-potsdam.de

Reference Articles:

Neuber, R., G. Beyerle, B. Heese, K. Stebel, P. von der Gathen, F. Wittrock, Aerosol, ozone, and temperature measurements with a multi-wavelength LIDAR at Spitsbergen, in: Abstracts of Papers, 17th Intern. Laser Radar Conf., Sendai, Japan, July 25-29, 1994

Wittrock, F., Lidar-Untersuchungen der Arktischen Stratosphäre, Diploma thesis, Univ. Bremen, 1994

Gathen, P. von der, B. Heese, G. Beyerle, R. Neuber, Multi-wavelength LIDAR configurations for polar stratospheric research, in: Abstracts of Papers, 17th Intern. Laser Radar Conf., Sendai, Japan, July 25-29, 1994

McGee, T.J., M. Gross, P. Newman, G. Beyerle, I. beninga, A. Dahl, R. Neuber, P. Wahl, O. Schrems, Lidar Temperature Measurements at Ny-Ålesund (79N) during Winter, 1998, pp343, Nineteenth Int. Laser Radar Conf., MASA/CP-1998-207671/PT1, 1998

Nerboe Dahl, A. Temperature in the Arctic stratosphere retrieved from lidar measurements in Ny-Ålesund, Cand.Scient. thesis, Univ. Trondheim, 1999

Instrument Description:

Location:

Ny-Alesund, Spitsbergen, 78.92°N, 11.93°E, 10 m asl

until fall 1994 in a 20ft container

since fall 1994 in a dedicated NDSC observatory

see <http://www.awi-potsdam.de/www-pot/koldewey/kolndscgeb.html>

Transmitter:

until 1994:

Continuum NY 61-30 Nd:YAG laser,

1064 nm (200 mJ),

532 nm (190 mJ),

30 Hz pulse repetition frequency

Lambda Physik EMG 150 TMSC Excimer laser

353 nm (150 mJ) (stimulated Raman scattering in H₂)

30 Hz pulse repetition frequency

since 1994:

Continuum NY 61-30 Nd:YAG laser,

1064 nm (200 mJ),

532 nm (190 mJ),

30 Hz pulse repetition frequency

Lambda Physik LPX 250T Excimer laser

353 nm (50-100 mJ) (stimulated Raman scattering in H₂)

90 Hz pulse repetition frequency

Receiver:

60 cm diameter Newtonian type telescope, mechanical chopper,

elastic backscattering : 353 nm, 532 nm, 1064 nm

inelastic backscattering : 385 nm, 607 nm

filter bandwidth:

0 nm (532 nm),

5 nm (355, 385, 607, 1064 nm);

polarization detection at 532 nm

Detectors:

EMI 9893Q / 9863QA (UV & VIS)

until 1994 w/o preamplifier,

since 1994 w. preamplifier

EG&G SPCM 100 (IR)

Signal and data processing:

until 1994: two dedicated Dual Multi Channel Counter (DMCC) for UV & VIS

since 1994: (and for all IR-data)

EG&G TurboMCS Multi channel scaler (photon counting)

Algorithm Description:

Standard backscatter lidar temperature retrieval, assuming hydrostatic equilibrium and ideal gas law. Depending on availability either one of the wavelengths 353 nm or 532 nm (parallel channel) is used. see A. Nerboe Dahl, 1999

Expected Precision/Accuracy of Instrument:

TBD 1999

Instrument History:

Measurement periods

winter 1988/1989	:	5 Jan 1989 -	26 Apr 1989
winter 1989/1990	:	19 Jan 1990 -	11 Mar 1990
winter 1990/1991	:	3 Jan 1991 -	17 Mar 1991
winter 1991/1992	:	13 Nov 1991 -	27 Mar 1992
winter 1992/1993	:	1 Dec 1992 -	1 Mar 1993
winter 1993/1994	:	5 Oct 1993 -	6 Apr 1994
winter 1994/1995	:	9 Jan 1995 -	5 Apr 1995
winter 1995/1996	:	1 Nov 1995	19 Mar 1996
winter 1996/1997	:	3 Jan 1997 -	6 Mar 1997
winter 1997/1998	:	24 Aug 1997 -	21 May 1998
winter 1998/1999	:	18 Oct 1998 -	30 May 1999

Detection channels

winter 1988/1989	:	353 nm (& 308 for O3-DIAL)
winter 1989/1990	:	353 nm (& 308 for O3-DIAL)
winter 1990/1991	:	353 nm (& 308 for O3-DIAL)
winter 1991/1992	:	353, 532p, 532s nm, (& 308 for O3-DIAL)
winter 1992/1993	:	353, 532p, 532s, 1064 nm, (& 308 for O3-DIAL)
winter 1993/1994	:	353, 385, 532, 607 nm, (& 308 for O3-DIAL)
winter 1994/1995	:	353, 385, 532p, 532s, 532, 607 nm, (& 308 for O3-DIAL)
winter 1995/1996	:	353, 385, 532p, 532s, 607 nm, (& 308, 332 for O3-DIAL)
winter 1996/1997	:	353, 385, 532p, 532s, 607 nm, (& 308 for O3-DIAL)
winter 1997/1998	:	353, 385, 532p, 532s, 607 nm, (& 308 for O3-DIAL)
winter 1998/1999	:	353, 532p, 532s, 607 nm, (& 308 for O3-DIAL)