File Revision Date:
January 11, 1997

Data Set Description:

PI: Hideaki Nakane
Instrument: Lidar
Site(s): Tsukuba, Japan
Measurement Quantities: Ozone
Temperature
(Aerosol)

Contact Information:

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Reference Articles:

N. Sugimoto, Y. Sasano, H. Nakane, S. Hayashida-Amano, I. Matsui and A. Minato. Oyobutsuri, 1989, 56, 1385-1397 (in Japanese). Multiple-wavelength laser radar for measuring stratospheric and tropospheric ozone profiles.

Y. Sasano, N. Sugimoto, H. Nakane, S. Hayashida-Amano, I. Matsui and A. Minato. Abstracts of First Tsukuba Workshop on Ozone DIAL, 1989, Tsukuba. Multiple-wavelength differential absorption lidar (DIAL) for measuring the ozone profiles in the stratosphere and troposphere.

H. Nakane, S. Hayashida, Y. Sasano, N. Sugimoto, I. Matsui and A. Minato. J. Geomag. Geoelectr., 1992, 44, 1071-1083. Vertical profiles of temperature and ozone observed during DYANA campaign with the NIES ozone lidar system at Tsukuba.

H. Nakane, Y. Sasano, S. Hayashida-Amano, N. Sugimoto, I. Matsui, A. Minato and M. P. McCormick. J. Meteorol. Soc. Japan, 1993, 71, 153-159. Comparison of ozone profiles obtained with NIES DIAL and SAGE II measurements.

H. Nakane, S, Hayashida, N. Sugimoto, I. Matsui and Y. Sasano. Annual Report on Global Environmental Monitoring -1993-, CGER-M003'93, National Institute for Environmental Studies, 1-31. Ozone lidar monitoring.

Y. Murayama, T. Tsuda, R. Wilson, H. Nakane, S. A. Hayashida, N. Sugimoto, I. Matsui and Y. Sasano. Geophys.Res. Lett., 1994, 21, 1539-1542. Gravity wave activity in the upper stratosphere and lower mesosphere observed with the Rayleigh lidar at Tsukuba, Japan.

H. Nakane, S. Hayashida, I. Matsui, N. Sugimoto, A. Minato and Y. Sasano. NASA Conf. Publ. 3266 Ozone in the Troposphere and Stratosphere, 1994, 863-866. Lidar observation of ozone over Tsukuba (35 N, 140 E)

H. Nakane, N. Sugimoto, Y. Sasano and I. Matsui. Annual Report on Global Environmental Monitoring - 1994-, CGER-M004'94, National Institute for Environmental Studies, 1-12. Ozone lidar monitoring.

Instrument Description:

March 1987 - February 1996

Transmitter

Laser	XeCl excimer laser	308 nm 339 nm (D2 Raman shifter)	140 mJ
	XeF excimer laser	351 nm	75 mJ
		repetition rate; 250 MHz (Max.), 94 Hz (Typ.)	
	3 times expanded	Beam divergence; 0.07 mrad	
	(both excimer laser were Lambda Physik EMG 160TMSC injection locked lasers)		

Receiver

Telescope diameter	2 m
Field of view	0.6 mrad (Typ.)
with chopper, dichroic mirrors, interference filters	

Detectors

Photomultipliers	Hamamatsu R3225 (6 channels)
with electrical gates (1-200 micro seconds) and 100MHz preamplifiers	

Signal and data processor

Photon counters with 1 micro second gate, 2048 segments (6 channels)
Toshiba AS 475

Algorithm Description for Ver. 1 data:

DIAL equation with aerosol correction assuming constant extinction/backscatter ratio.
US standard atmosphere is assumed to obtain temperature and air density profiles for calculation of ozone profiles.

Expected Precision/Accuracy of Instrument:

<10% depending on measurements and altitudes

Instrument History:

1987.3	Installation
1990.8	Modification of Transmitter/telescope system for better accuracy. Stability of measurements and accuracy of the data were improved substantially.
1991.10	Start of monitoring program.
1996.3-	Modification of the transmitter and receiver system.