

File Revision Date:

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Data Set Description:

PI: Thomas Trickl
Instrument: Lidar
Site(s): Garmisch-Partenkirchen, Germany
Measurement Quantities: Aerosol

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Instrument Description:

Location:

Garmisch-Partenkirchen, 47.5 degree N, 11.1 degree E,
elevation 730 msl;

Transmitter:

Quanta-Ray GCR-4 Nd:YAG laser; 1064 (1.1 J), 532 (0.6 J),
355 nm (0.3 J); pulse repetition 10 Hz;

Receiver:

52 cm diameter Cassegrain telescope; variable chopper;
bandwidth 1 nm (1064 nm, 532 nm), 10 nm (355 nm);

Detectors:

2 EMI 9128A analog PMTs; 1 EMI D341 photon counting PMT;
Depolarization at 532 nm;
CCD camera with variable FOV (B/W)
4-channel framegrabber (8 bit)

Signal and data processing:

4-channel transient recorder (10 bit, 50 MHz);
2-channel photon counter (200 MHz, 8K, 32 bit).

Algorithm Description:

Rayleigh normalization at reference altitude 25 km to 35 km, atmospheric density from Munich radiosonde and NCEP data.

Algorithm intercomparison: see Steinbrecht et al.

Expected Precision/Accuracy of Instrument:

Accuracy:

Error of maximum scattering ratio: 1% to 5%;
Error of integrated backscatter: 8% (volcanic), 15% (aged),
60% (background).

Instrument History:

Mark 1 instrument built in 1973 as ruby lidar;
Mark 2 instrument built in 1991 as Nd:YAG lidar;
Stratospheric backscatter profiles measured since 1976.