

Final project report

Project ID: 2002/6.3
Title: Analysis of the 1989-1999 cloud data set of the Dumont D'Urville (DDU) backscatter LIDAR

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Duration: 2 years
Assigned funding: €20.000,00

Activities and results

In the first year of activity, a VisualBasic-MATLAB software for the analysis of DDU LIDAR data was developed at IFAC CNR (the DDU LIDAR is a 532 nm backscatter LIDAR, equipped with a depolarisation channel). The software is composed of several modules, each performing a different task:

- Modules for searching and reading from the archive the desired LIDAR and radiosonde data
- Module for the inversion of the LIDAR data in terms of volume backscatter and extinction profiles
- Module for the extraction from the LIDAR profiles of synthetic cloud information: cloud base, top, mean extinction and backscatter, integrated extinction and backscatter, depolarization, base and top temperatures. Synthetic data are stored in matrixial form for a fast post-processing and statistical analysis.
- Module for a graphical plot of the synthetic data as scatter plots

The LIDAR software was used in the second year of the project for the analysis of the DDU LIDAR data collected in the 1989-1999 period. The quality and quantity of the collected data was very variable within the 1989-1999 period. The best years in terms of quantity and quality of the measurements resulted to be 1989 and 1990. The number of measurement days for each year of the serie is reported below:

1989: 205 days of valid measurements
1990: 64 days of valid measurement
1991: 0 days of valid measurement
1992: 108 days of valid measurement
1993: 0 days of valid measurement
1994: 14 days of valid measurement
1995: 12 days of valid measurement
1996: 16 days of valid measurement
1997: 0 days of valid measurement
1998: 6 days of valid measurement
1999: 4 days of valid measurement

Products

A – papers in scientific magazines

1. M. Del Guasta, E. Vallar. In-cloud variability of LIDAR depolarization of polar and midlatitude cirrus. *Geophys. Res. Lett.*, 1578-1582, 2003.

B – book chapters

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C - proceedings of international conferences

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D – proceedings of national meetings and conferences

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E – thematic maps

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F – patents, prototypes and data bases

1. LIDAR-derived database of DDU tropospheric clouds

G – exhibits, organization of conferences, editing and similar

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H - formation (PhD thesis, research fellowships, etc.)

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Research units

IFAC CNR: Del Guasta Massimo, Castagnoli Francesco, Venturi Valerio, Morandi Marco

Date: 15 Ottobre 2008
