Programma Nazionale di Ricerche in Antartide (PNRA)

Final project report

Project ID	2003/6.01
Title	STAGE: STAte of the art of the Antarctic stratosphere research activity: dynamics, chemistry and microphysics; acquired knowledge and open issues in sight of a possible airborne campaign with the M55 GEophysica.
Principal investigator	Alberto Adriani
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Duration	2 years
Assigned funding	45.000,00 Euro

Activities and results

In view of a possible future research activity in Antarctica with the M55 Geophysica stratospheric aircraft, the STAGE project aimed at developing a feasibility study in order to establish the state of knowledge on the Antarctic stratosphere and focus on the main issues still unresolved in polar stratospheric ozone research. This study has been done through a review of the work done in the last fifteen years, both on the theoretical and experimental side.
An evaluation of previous airborne measurement campaigns in the Arctic and Antarctica, an assessment of the exploitation of the data gathered during these activities a definition of the issues still matter of debate within the scientific communitiy has been carried out in order assess what has been learned from those activities, and what could be the best strategies to resolve the issues left unsettled in Polar chemistry and microphysics. The study of previous campaign results has especially focused on the outcomes of the 1999 APE-GAIA campaign with particular attention to the possibility to use these measures in conjunction with satellite data, to tackle a number of unresolved issues;
Studies have been conducted on the climatology of several key parameters that characterize the Antarctic stratosphere, with particular emphasis on transport processes within and outside the polar vortex.
Eventually, a review of the state of the art and a list of open problems has been depicted and written down in the form of a final report, that may form the starting point for building a possible future deployment of the M55 Geophysica in Antarctica. In the final report were highlighted research problems in the light of the recent revaluation of the photo-dissociation constant of dimer CLO-CLO and its impact on the chemistry of the polar stratosphere, and research strategies aimed at better understanding of stratospheric chemistry and microphysics are indicated.

Products

A – papers in scientific magazines

B – book chapters

1. "STAte of the art of the Antarctic stratosphere research activity: dynamics, chemistry and microphysics; acquired knowledge and open issues in sight of a possible airborne campaign with the M55 GEophysica" Final Report. Pagg.1-97; Alberto Adriani, Francesco Cairo, Tiziana Colavitto, Ugo Cortesi, Paola Massoli, Gianluca Redaelli, Barbara Grassi.

C - proceedings of international conferences

D – proceedings of national meetings and conferences

E – thematic maps

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F – patents, prototypes and data bases

G – exhibits, organization of conferences, editing and similar

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

Two research fellowships

Research units

U.O. #1 (INAF-IFSI)	Dr. Alberto Adriani
U.O. #2 (CNR-ISAC)	Dr. Francesco Cairo
U.O. #3 (Università di L'Aquila)	Dr. Gianluca Redaelli
U.O. #4 (CNR-IFAC)	Dr. Ugo Cortesi

Date: 31 March 2010

Notes