

## PROJECT ADMINISTRATION DATA SHEET



ORIGINAL



REVISION NO. \_\_\_\_\_

Project No. G-35-601DATE: 5-5-81Project Director: G W GRAMSSchool/Lab Geo Phys SecSponsor: National Science Foundation  
Washington, DC 20550Type Agreement: Grant No. INT-81051021/31/83Award Period: From 5-1-81 To 10-31-83 (Performance) 10-31-83 (Reports)Sponsor Amount: \$ 14,886

Contracted through:

Cost Sharing: \$ 1,131 (G-35-359) prorated amount

GTRI/

Title: Studies of Changes in the Characteristics of Particulates and Minor Species Across the Tropopause

## ADMINISTRATIVE DATA

## OCA CONTACT

Don Hosty1) Sponsor Technical Contact: MS Marilyn Rusk, Room 1214,  
International Programs, National Science Foundation, 1800 G  
Street, N.W., Wash, DC 20550 phone (202) 357-75542) Sponsor Admin./Contractual Contact: Martin V. Geary, NSF Grants  
Official, Division of Grants & Contracts, Directorate for Administration,  
National Science Foundation, Wash DC 20550 ph (202) 357-9653Reports: See Deliverable Schedule Security Classification: NoneDefense Priority Rating: None

## RESTRICTIONS

See Attached NSF Supplemental Information Sheet for Additional Requirements

Travel: Foreign travel must have prior approval - Contact OCA in each case. Domestic travel requires sponsor approval where total will exceed greater of \$500 or 125% of approved proposal budget category.

Equipment: Title vests with N/A - none proposedCOMMENTS: NSF intends to extend to three years, pending  
availability of funds and scientific progress of the  
project.

## COPIES TO:

Administrative Coordinator  
Research Property Management  
Accounting OfficeResearch Security Services  
Reports Coordinator (OCA)  
Legal Services (OCA)EES Research Public Relations  
Project File (OCA)  
Other: \_\_\_\_\_

SPONSORED PROJECT TERMINATION SHEET

Date September 2, 1983

Project Title: Studies of Changes in the Characteristics of Particulates  
and Minor Species Across the Tropopause

Project No: G-35-601

Project Director: Gerald W. Grams

Sponsor: National Science Foundation

Effective Termination Date: 8/31/83

Clearance of Accounting Charges: 8/31/83

Grant/Contract Closeout Actions Remaining:

None

- ☐ Final Invoice and Closing Documents
- ☐ Final Fiscal Report
- ☐ Final Report of Inventions
- ☐ Govt. Property Inventory & Related Certificate
- ☐ Classified Material Certificate
- ☐ Other \_\_\_\_\_

Project is continued by G-35-623, which terminates 10/31/83.  
Annual progress report prepared 4/12/83.

Assigned to: \_\_\_\_\_ (School/Laboratory)

COPIES TO:

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Computer Input  
Project File  
Other \_\_\_\_\_

635-601

# Georgia Institute of Technology

A UNIT OF THE UNIVERSITY SYSTEM OF GEORGIA

ATLANTA, GEORGIA 30332

SCHOOL OF GEOPHYSICAL SCIENCES

31 MARCH 1983

404/894-3893

Ms. Marilyn Rurak  
Room 1214, International Programs  
National Science Foundation  
1800 G Street, N.W.  
Washington, D.C. 20550

Dear Ms. Rurak:

This letter summarizes progress during the past year on the U.S.-Italy Cooperative Science Program's project "Studies of Changes in the Characteristics of Particulates and Minor Species Across the Troposphere" which is being carried out under NSF grant number INT8105102. After reviewing the discussion of our research plans in the original proposal, I am pleased to report that we are still making good progress on our original goals. The "U2 nephelometer" system that we described in the proposal was completed last year. It flew on the NASA Ames Research Center's U2 aircraft in October 1981, March 1982, July 1982, November 1982, and December 1982. On each of these flights, other "U2 experimenters" made simultaneous observations of aerosol characteristics such as particle mass concentrations, size distributions, and absorption coefficients.

The selection of observations that were made as part of the U2 aerosol measurement system was based on NASA's desire to define the optical and radiative properties of aerosol particles in the stratosphere for use in climate models. Aerosol particles are expected to cause significant climatic perturbations at times following volcanic eruptions that inject significant amounts of fine ash particles and sulfur-bearing gases into the stratosphere.

The eruption of the El Chichón volcano in the spring of 1982 was just such an eruption; in fact, some believe that it may turn out to be the most significant aerosol-climate perturbation of the past century. As a result, the expected frequency of U2 aerosol observations was stepped up appreciably in the past years time. This increased effort in NASA's U2 aerosol observation program has had both positive and negative implications with respect to our other work. Obviously, the existence of the El Chichon volcanic aerosol layer has been the subject of intense scientific interest, and we thereby benefitted from the unexpected opportunity for obtaining data on the El Chichón cloud. However, the intense interest in the cloud did result in a doubling of the number of U2 flights over the 2 per year outlined in NASA's original observation program. The larger number of days in the field has decreased the time that we have available for laboratory studies with the instrument. As it stands now, our laboratory studies on the  $H_2SO_4$ /water concentration rates are a little behind schedule; we should, however, be able to finish that work by Summer 1983.

In addition to the work that was completed on the polar nephelometer, we found that we were able to interact with Dr. Fiocco and his group in several other ways. Dr. Fiocco's group in Italy has made good progress on the development of their numerical model for aerosol formation and growth. On the basis of calculations with the model, Dr. Fiocco felt that water clouds should form in thin layers within the first few kilometers of the stratosphere in tropical regions. Since I am also a member of NASA's experiment team for the SAGE (Stratospheric Aerosol and Gas Experiment) satellite sensor, I had a set of computer tapes which stored the first year of data obtained by the SAGE satellite sensor which measures aerosol extinction coefficients versus altitude. This data on global aerosol distributions is stored on magnetic tapes with approximately 1-km altitude resolution. Dr. Fiocco and I decided that it would be of considerable interest to the Italian aerosol modelling effort to search our SAGE data tapes for evidence of the layers predicted by the model.

In accordance with the possibilities for joint work discussed in our original proposal, Mr. Luca Crescentini, one of the junior members of Dr. Fiocco's group in Italy, spent Summer 1982 in my laboratory to examine SAGE data tapes to search for the aerosol layers of the type suggested by the Italian aerosol model. Mr. Crescentini spent a good part of the summer developing computer programs for reading the tapes, identifying SAGE aerosol profiles with thin layers, and plotting all aerosol extinction profiles that displayed thin layers for use in comparisons with the Italian model. He completed a preliminary analysis of the SAGE data and left at the end of the summer with plans to continue the study in Italy. During the next year, we hope to see that work progress to the point at which conclusions can be finalized and results published.

With regard to future plans, we have enclosed our budget for the third year of our 3-year grant. During this coming year, we plan to complete the "U2 nephelometer" laboratory studies for determining  $H_2SO_4$ /water ratios in aerosol droplets, as discussed in last years report. We then expect to be able to apply our laboratory results to the polar nephelometer observations of light scattering particles in the El Chichón aerosol layer. These results may then be incorporated into the Italian aerosol model.

I am enclosing a list of my current and pending support with this letter. I am also enclosing our budget request for the third year of this grant, signed by Georgia Tech's Office of Contract Administration. Please contact me if you need any additional information.

With ~~best~~ wishes,

✓ Gerald W. Grams  
Professor  
School of Geophysical Sciences

GWG:ejf  
enclosures