Sulfates, Clouds and Radiation America (SCAR-A) NASA ER-2 Moderate Resolution Imaging Spectrometer (MODIS) Airborne Simulator (MAS) Langley DAAC Data Set Document

Summary:

The primary objective of the SCAR-A experiment was to help scientists characterize the the relationship between sulfate particles and clouds' reflective properties. Sulfate aerosols are believed to provide condensation nuclei, resulting in smaller, more numerous droplets within a cloud.

SCAR-A (America) was the first in a series of experiments. It was followed by the SCAR-C experiment conducted over California in 1994. A third experiment, SCAR-B (Smoke, Clouds and Radiation-Brazil), was conducted in Brazil during August and September 1995.

This document provides information for the SCAR_A_ER2_MAS data set.

Table of Contents:

1. Data Set Overview:

Data Set Identification:

SCAR_A_ER2_MAS:	Sulfates, Clouds and Radiation America (SCAR-A) NASA ER-2 Moderate Resolution Imaging Spectroradiometer (MODIS) Airborne Simulator (MAS) Data (SCAR_A_ER2_MAS)

Data Set Introduction:

The MODIS Airbourne Simulator (MAS) is a modified Daedalus Wildfire scanning spectrometer which flies on a NASA ER-2 and provides

spectral information similar to that which will be provided by the Moderate Resolution Imaging Spectroradiometer (MODIS), scheduled to be launched on the EOS-AM platform in 1998 (King et al. 1992). The principal investigators for the MAS are Dr. Michael King (NASA/GSFC, Greenbelt MD), and Dr. Paul Menzel (NOAA/NESDIS, Madison WI).

The MAS spectrometer acquires high spatial resolution imagery in the wavelength range of 0.55 to 14.3 microns. A total of 50 spectral bands are available in this range, and the digitizer can be configured to collect data from any 12 of these bands. The digitizer was configured with four 10-bit channels and seven 8-bit channels. The MAS spectrometer was mated to a scanner subassembly which collected image data with an IFOV of 2.5 mrad, giving a ground resolution of 50 meters from 20000 meters altitude, and a cross track scan width of 85.92 degrees. The data granules were written using the self documenting file storage format provided through the netCDF interface routines included in the HDF libraries.

Objective/Purpose:

Information not available at this time.

Summary of Parameters:

Information not available at this time.

Discussion:

Information not available at this time.

Related Data Sets:

FIRE_AX_ER2_MAS:	First ISCCP Regional Experiment (FIRE) Atlantic Stratocumulus Transition Experiment (ASTEX) NASA ER-2 Moderate Resolution Imaging Spectroradiometer (MODIS) Airborne Simulator (MAS) Data (FIRE_AX_ER2_MAS)
FIRE_CI2_ER2_MAS:	First ISCCP Regional Experiment (FIRE) Cirrus 2 NASA ER-2 Moderate Resolution Imaging Spectroradiometer (MODIS) Airborne Simulator (MAS) Data (FIRE_CI2_ER2_MAS)
SCAR_B_ER2_MAS:	Smoke, Clouds and Radiation Brazil (SCAR-B) NASA ER-2 Moderate Resolution Imaging Spectroradiometer (MODIS) Airborne Simulator (MAS) Data (SCAR_B_ER2_MAS)

2. Investigator(s):

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Title of Investigation:

Sulfates, Clouds and Radiation America (SCAR-A) NASA ER-2 Moderate Resolution Imaging Spectroradiometer (MODIS) Airborne Simulator (MAS)

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3. Theory of Measurements:

Information not available at this time.

4. Equipment:

Sensor/Instrument Description:

See MAS User's Guide.

Calibration:

See MAS User's Guide.

5. Data Acquisition Methods:

Information not available at this time.

6. Observations:

Data Notes:

Information not available at this time.

Field Notes:

Information not available at this time.

7. Data Description:

Spatial Characteristics:

Spatial Coverage:

Data Set	Min Lat	Max Lat	Min Lon	Max Lon
SCAR_A_ER2_MAS	35.02	44.54	-99.97	-79.75

Spatial Coverage Map:

None available.

Spatial Resolution:

50 meters (at 20 kilometers altitude)

Projection:

Information not available at this time.

Grid Description:

Information not available at this time.

Temporal Characteristics:

Temporal Coverage:

Data Set	Begin Date	End Date
SCAR_A_ER2_MAS	07-12-1993	07-29-1993

Temporal Coverage Map:

None available.

Temporal Resolution:

Each granule contains one flight track.

Data Characteristics:

See MAS User's Guide.

8. Data Organization:

Data Granularity:

A general description of data granularity as it applies to the IMS appears in the EOSDIS Glossary.

Each granule contains one flight track.

Data Format:

The data are in NCSA'S HDF/netCDF format.

9. Data Manipulations:

Formulae:

Derivation Techniques and Algorithms:

Information not available at this time.

Data Processing Sequence:

Processing Steps:

Information not available at this time.

Processing Changes:

Information not available at this time.

Calculations:

Special Corrections/Adjustments:

Information not available at this time.

Calculated Variables:

Information not available at this time.

Graphs and Plots:

There are two browse images, infrared and visible, per granule.

10. Errors:

Sources of Error:

Information not available at this time.

Quality Assessment:

Data Validation by Source:

Information not available at this time.

Confidence Level/Accuracy Judgement:

Information not available at this time.

Measurement Error for Parameters:

Information not available at this time.

Additional Quality Assessments:

Information not available at this time.

Data Verification by Data Center:

Information not available at this time.

11. Notes:

Limitations of the Data:

Information not available at this time.

Known Problems with the Data:

Information not available at this time.

Usage Guidance:

Information not available at this time.

Any Other Relevant Information about the Study:

Information not available at this time.

12. Application of the Data Set:

Information not available at this time.

13. Future Modifications and Plans:

There are no plans to modify these data sets.

14. Software:

Software Description:

Sample read software are available for these data sets. The codes are written in C. A makefile and readme file are also available. These files allow users to compile and output the data.

Software Access:

The software can be obtained through the Langley DAAC User Services Office. Please refer to the contact information in Section 15. The software can also be ordered through the on-line system while ordering these data sets.

15. Data Access:

Contact Information:

Langley DAAC User and Data Services Office
NASA Langley Research Center
Mail Stop 157D
Hampton, Virginia 23681-2199
USA
Telephone: (757) 864-8656
FAX: (757) 864-8807
E-mail: support-asdc@earthdata.nasa.gov

Data Center Identification:

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Mail Stop 157D
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FAX: (757) 864-8807
E-mail: support-asdc@earthdata.nasa.gov

Procedures for Obtaining Data:

The data are available from the Langley Data Center web site.

Data Center Status/Plans:

The Langley DAAC will continue to archive these data sets. There are no plans to reprocess.

16. Output Products and Availability:

None available.

17. References:

Arnold, G.T., M. Fitzgerald, P.S. Grant, and M.D. King, 1994a: *MODIS Airborne Simulator Visible and Near-Infrared Calibration - 1991 FIRE-Cirrus Field Experiment.* NASA Goddard Space Flight Center, NASA Technical Memorandum 104600.

Arnold, G.T., M. Fitzgerald, P.S. Grant, and M.D. King, 1994b: *MODIS Airborne Simulator Visible and Near-Infrared Calibration - 1992 ASTEX Field Experiment.* NASA Goddard Space Flight Center, NASA Technical Memorandum 104599.

Gumley, L.E., P.A. Hubanks, E.J. Masuoka, 1994: *MODIS Technical Report Series: Volume 3, MODIS Airborne Simulator Level 1B Data User's Guide.* NASA Goddard Space Flight Center, NASA Technical Memorandumn 104594.

Jedlovec, G.J., K.B. Batson, R.J. Atkinson, C.C. Moeller, W.P. Menzel, and M.W. James, 1989: *Improved Capabilities of the Multispectral Atmospheric Mapping Sensor (MAMS).* NASA Marshall Space Flight Center, NASA Technical Memorandum 100352.

King, M.D., Y.J. Kaufman, W.P. Menzel and D.Tanre, 1992: Remote sensing of cloud, aerosol, and water vapor Properties from the Moderate Resolution Imaging Spectrometer (MODIS). *IEEE Trans. Geosci. Remote Sens.*, 30, 2-27.

King, M.D., W.P. Menzel, P.S. Grant, J.S. Myers, G.T. Arnold, S.E. Platnick, L.E. Gumley, S-C. Tsay, C.C. Moeller, M. Fitzgerald, K.S. Browsn and F.G. Osterwisch, 1996: Airborne Scanning Spectrometer for Remote Sensing of Cloud, Aerosol, Water Vapor, and Surface Properties. *Journal of Atmospheric and Oceanic Technology*, 13(4), 777-794.

18. Glossary of Terms:

EOSDIS Glossary.

19. List of Acronyms:

NASA - National Aeronautics Space Administration

URL - Uniform Resource Locator

EOSDIS Acronyms.

20. Document Information:

Document Revision Date:
October 01, 1996; May 29, 1997; November 24, 1997; July 1999
Document Review Date:
October 01, 1996
Document ID:
...
Citation:
...
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