

First ISCCP Regional Experiment (FIRE) Cirrus 1 Colorado State University (CSU) Sabreliner Aircraft Langley DAAC Data Set Document



Summary:

The First ISCCP Regional Experiments (FIRE) have been designed to improve data products and cloud/radiation parameterizations used in general circulation models (GCMs). Specifically, the goals of FIRE are (1) to improve basic understanding of the interaction of physical processes in determining life cycles of cirrus and marine stratocumulus systems and the radiative properties of these clouds during their life cycles and (2) to investigate the interrelationships between the ISCCP data, GCM parameterizations, and higher space and time resolution cloud data.

To-date, four intensive field-observation periods were planned and executed: a cirrus IFO (October 13-November 2, 1986); a marine stratocumulus IFO off the southwestern coast of California (June 29-July 20, 1987) a second cirrus IFO in southeastern Kansas (November 13-December 7, 1991); and a second marine stratocumulus IFO in the eastern North Atlantic Ocean (June 1-June 28, 1992). Each mission combined coordinated satellite, airborne, and surface observations with modeling studies to investigate the cloud properties and physical processes of the cloud system.

This data set contains meteorological and radiometric data from the NCAR Sabreliner aircraft that was collected during the 1986 FIRE Cirrus IFO.

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1. Data Set Overview:

Data Set Identification:

FIRE_C11_CSU_SABRE:

First ISCCP Regional Experiment (FIRE) Cirrus 1 Colorado State
University (CSU) Sabreliner Aircraft Data (FIRE_C11_CSU_SABRE)



Data Set Introduction:

Project FIRE (First ISCCP Regional Experiment) is a U.S. cloud climatology research program to validate and improve ISCCP (International Satellite Cloud Climatology Project) data products and cloud/radiation parameterizations used in general circulation models (GCMs).

The primary emphasis of FIRE is the study of marine stratocumulus and cirrus cloud systems. These two cloud types were selected because of their recognized importance for global climate and their scientific appeal for many members of the scientific community.

Objective/Purpose:

The objective of FIRE is to investigate the cloud properties and physical processes of the cloud systems using combined and coordinated satellite, airborne, and surface observations with modeling studies.

The goals of FIRE are (1) to improve the basic understanding of the interaction of physical processes in determining life cycles of cirrus and marine stratocumulus systems and the radiative properties of these clouds during their life cycles and (2) to investigate the interrelationships between the ISCCP data, GCM parameterizations, and higher space and time resolution cloud data.

Summary of Parameters:

Absolute Humidity
Barometric Altitude
Cloud Ice
Dew/Frost Point Temperature
Infrared Radiation
Mixing Ratio
Potential Temperature
Relative Humidity
Shortwave Radiation
Specific Humidity
Static Pressure
Temperature
Vertical Wind Speed
Wind Direction
Wind Speed

Discussion:

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Related Data Sets:

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2. Investigator(s):

Investigator(s) Name and Title:

Dr. Stephen K. Cox
Department of Atmospheric Science
Colorado State University

Title of Investigation:

First ISCCP Regional Experiment (FIRE)

Contact Information:

Dr. Stephen K. Cox



3. Theory of Measurements:

...

4. Equipment:

Sensor/Instrument Description:

The NCAR Sabreliner research aircraft is a Rockwell International Sabreliner Model 60 aircraft, a low-wind twin-jet monoplane.

Collection Environment:

...

Source/Platform:

NCAR SABRELINER

Source/Platform Mission Objectives:

...

Key Variables:

The NCAR instrumentation that measured the data described consisted of:

1. **Aircraft Position, Velocity and Attitude**

Litton LTN-51 INS (Inertial Navigation System)

2. **Static Pressure**

Rosemount Model 1201F1 Pressure Transducer (Fuselage Port)

3. **Temperatures**

Rosemount Type 102 Non-dieced and Dieced Sensors (with Rosemount Model 510BH Amplifiers)

4. **Dew Point and Humidity**

EG&G Model 137-C3 Dew Point Hygrometers

NCAR Model LA-3 Lyman-alpha Hygrometer

5. **Flow Angle Sensors**

Rosemount Model 858 Gust Probe

Rosemount Model 1221FVL Differential Pressure Transducer

6. **Cloud Physics**

Rosemount 871A Icing Rate Detector

7. **Radiation Irradiances**

Shortwave Radiation (.3 - 2.8 microns): RAF Mod. Epply Model PSP Pyranometers

Near Infrared Radiation (.7 - 2.8 microns): RAF Mod. Epply Model PSP Pyranometers

Infrared Radiation (4 - 50 microns): RAF Mod. Epply Model PIR Pyrgeometers

Principles of Operation:

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Sensor/Instrument Measurement Geometry:

...



Manufacturer of Sensor/Instrument:

Rockwell International

Sensor/Instrument:

- Deiced Sensors
- Gust Probe
- Hygrometer
- Icing Rate Detector
- Pressure Transducer
- Pyranometer
- Pyrgeometer

Calibration:

Specifications:

...

Tolerance:

...

Frequency of Calibration:

...

Other Calibration Information:

Calibration information can be obtained from CSU and NCAR. The shortwave and near IR irradiances have been corrected for the effects of temperature as described in "Temperature Sensitivity of Epply Broadband Radiometers."

5. Data Acquisition Methods:

...

6. Observations:

Data Notes:

...

Field Notes:

...

7. Data Description:

Spatial Characteristics:

Spatial Coverage:

<u>Data Set Name</u>	<u>Min Lat</u>	<u>Max Lat</u>	<u>Min Lon</u>	<u>Max Lon</u>
FIRE_CI1_CSU_	41.0	48.0	-89.0	-90.0
SABRE				

Spatial Coverage Map:

There are no maps available for this data set.

Spatial Resolution:

Observations are considered to be point measurements and can be found between 41 N and 48 N, 98 W and 85 W, and between 200 and 13000 m altitude above sea level.

Projection:

...

Grid Description:

...

Temporal Characteristics:

Temporal Coverage:

<u>Data Set Name</u>	<u>Begin Date</u>	<u>End Date</u>
FIRE_C11_CSU_SABRE	10-13-1986	11-02-1986

Temporal Coverage Map:

There are no maps available for this data set.

Temporal Resolution:

Observations were saved one per second (1 hertz data)

Data Characteristics:

Parameter/Variable:

...

Variable Description/Definition:

...

Unit of Measurement:

...

Data Source:

...

Data Range:

...

Sample Data Record:

...

8. Data Organization:

Data Granularity:

A general description of data granularity as it applies to the IMS appears in the [EOSDIS Glossary](#).

Data Format:

The data are in native binary data format (Standard Data Format, SDF).

9. Data Manipulations:



Formulae:

Derivation Techniques and Algorithms:

...

Data Processing Sequence:

Processing Steps:

...

Processing Changes:

...

Calculations:

Special Corrections/Adjustments:

...

Calculated Variables:

...

Graphs and Plots:

Images are not available for this data set.

10. Errors:

Sources of Error:

...

Quality Assessment:

Data Validation by Source:

...

Confidence Level/Accuracy Judgement:

...

Measurement Error for Parameters:

...

Additional Quality Assessments:

...

Data Verification by Data Center:

The Langley DAAC performs an inspection process on this data received by the data producer via ftp. The DAAC checks to see if the transfer of the data completed and were delivered in their entirety. An inspection software was developed by the DAAC to see if the code was able to read every granule. The code also checks to see if every parameter of data falls within the ranges which are included in the granule. This same code extracts the metadata required for ingesting the data into the IMS. If any discrepancies are found, the data producer is contacted. The discrepancies are corrected before the data are archived at the DAAC.

11. Notes:

Limitations of the Data:

...



Known Problems with the Data:

...

Usage Guidance:

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Any Other Relevant Information about the Study:

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12. Application of the Data Set:

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13. Future Modifications and Plans:

There are no plans for future modifications of these data sets.

14. Software:

Software Description:

Sample read software are available.

Software Access:

The software can be obtained through the Langley DAAC. Please refer to the contact information below. The software can also be obtained at the same time the user is 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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USA
Telephone: (757) 864-8656
FAX: (757) 864-8807
E-mail: support-asdc@earthdata.nasa.gov

Procedures for Obtaining Data:

The Langley DAAC Information Management System (IMS) is an on-line system that features a graphical user interface (GUI) which allows users to query the Langley DAAC data set holdings, to view pre-generated browse products, and to order specific data products. Users may also request data by letter, telephone, electronic mail (INTERNET), or personal visit.

The Langley DAAC User and Data Services staff provides technical and operational support for users ordering data. The Langley DAAC Handbook is available in a postscript file through the IMS for users who want detailed information about the Langley DAAC holdings. Users may also obtain a copy by contacting:



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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
URL: <http://eosweb.larc.nasa.gov>

Data Center Status/Plans:

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

16. Output Products and Availability:

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17. References:

Smith, W.L., Jr., Cox, S.K., and Glover, V. "Temperature Sensitivity of Epply Broadband Radiometers," FIRE Series 5

The Sabreliner Data Set of the FIRE Cirrus IFO: FIRE Series 1

Sorlie, S., February 1993. "Langley DAAC Handbook." NASA Langley Research Center, Hampton, Virginia.

18. Glossary of Terms:

See the [EOSDIS Glossary](#) for a more general listing of terms related to the Earth Observing System project.

19. List of Acronyms:

See the [EOSDIS Acronyms](#) for a more general listing of terms related to the Earth Observing System project.

20. Document Information:

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Document Curator:

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