First ISCCP Regional Experiment (FIRE) Sabreliner Aircraft Langley DAAC Data Set Document

Summary:

The First ISCCP Regional Experiments 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 (July 1 - July 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 systems.

This document provides information for the following data sets:

- FIRE_CI1_SABRELINER
- FIRE_CI2_SABRELINER

Table of Contents:

1. Data Set Overview:

Data Set Identification:

FIRE_CI1_SABRELINER:	First ISCCP Regional Experiment (FIRE) Cirrus 1 National Center for Atmospheric Research (NCAR) Sabreliner Aircraft Data (FIRE_CI1_SABRELINER)
FIRE_CI2_SABRELINER:	First ISCCP Regional Experiment (FIRE) Cirrus 2 National Center for Atmospheric Research (NCAR) Sabreliner Aircraft Data

Data Set Introduction:

FIRE_CI1_SABRELINER
Cirrus IFO-I was conducted from October 13 to November 2, 1986 in central Wisconsin. The NCAR Sabreliner aircraft measured radiation and microphysical properties of the cloud layers, in addition to temperature, moisture, and air motions.

FIRE_CI2_SABRELINER
Cirrus IFO-II was conducted from November 9 to December 8, 1991 in Coffeyville, Kansas. The NCAR Sabreliner aircraft measured radiation and microphysical properties of the cloud layers, in addition to temperature, moisture, and air motions.

Objective/Purpose:

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Summary of Parameters:

Humidity
Ice
Irradiance
Mixing Ratio
Pressure
Temperature
Wind Direction
Wind Speed

Discussion:

...

Related Data Sets:

...

2. Investigator(s):

Investigator(s) Name and Title:

...

Title of Investigation:

First ISCCP Regional Experiment (FIRE)

Contact Information:

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3. Theory of Measurements:

...

4. Equipment:

Sensor/Instrument Description:

Collection Environment:

...

Source/Platform:

NCAR SABRELINER

Source/Platform Mission Objectives:

...

Key Variables:

FIRE_CI1_SABRELINER:	Humidity Ice Irradiance Mixing Ratio Pressure Temperature Wind Direction Wind Speed
FIRE_CI2_SABRELINER:	Humidity Ice Irradiance Pressure Temperature Wind Direction Wind Speed

Principles of Operation:

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Sensor/Instrument Measurement Geometry:

...

Manufacturer of Sensor/Instrument:

...

Sensor/Instrument:

DEICED SENSORS
GUST PROBE
HYGROMETER
ICING RATE DETECTOR
PRESSURE TRANSDUCER
PYRANOMETER
PYRGEOMETER

Calibration:

Specifications:

...

Tolerance:

...

Frequency of Calibration:

...

Other Calibration Information:

...

5. Data Acquisition Methods:

...

6. Observations:

Data Notes:

...

Field Notes:

...

7. Data Description:

Spatial Characteristics:

Spatial Coverage:

Data Set Name	Min Lat	Max Lat	Min Lon	Max Lon
FIRE_CI1_SABRELINER	13.72	47.20	-96.99	-84.53
FIRE_CI2_SABRELINER	27.08	38.95	-99.25	-92.67

Spatial Coverage Map:

...

Spatial Resolution:

...

Projection:

...

Grid Description:

...

Temporal Characteristics:

Temporal Coverage:

Data Set Name	Begin Date	End Date
FIRE_CI1_SABRELINER	10-13-1986	11-02-1986
FIRE_CI2_SABRELINER	11-17-1991	12-07-1991

Temporal Coverage Map:

...

Temporal Resolution:

...

Data Characteristics:

Parameter/Variable:

FIRE_CI1_SABRELINER
Each of the 18 Sabreliner data files has 106 variables. Each variable is defined as a 4 bytes unsigned integer. The unsigned integer values have to be converted to real numbers for correct reading. Usually the variables are sampled at 1 Hz per second (per genpro cycle), but some variables are sampled at higher rate. The sample read routine automatically retrieves the information for all defined parameters, and interprets the binary data accordingly.

FIRE_CI2_SABRELINER
Each of the 19 Sabreliner data files has 106 variables. Each variable is defined as a 4 bytes unsigned integer. The unsigned integer values have to be converted to real numbers for correct reading. Usually the variables are sampled at 1 Hz per second (per genpro cycle), but some variables are sampled at higher rate. The sample read routine automatically retrieves the information for all defined parameters, and interprets the binary data accordingly.

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.

FIRE_CI1_SABRELINER:
The Sabreliner data set has 18 header-data-file pairs for 18 flights. Each flight is named ci1_aircraft_flt#_flighttime, where "aircraft" is 'sa' to Sabreliner, flight# is ranging from 01 through 18 for Sabreliner. Flight 2, 5, 7, 10, 12, 13, and 14 have a and b. "flighttime" has the format of yymmdd to indicate the date of the flight, e.g., ci1_sa_flt02a_861015. The flight name is the same as granule name. The header files are

named granule_name.hdr, and the data files are named granule_name.dat.

FIRE_CI2_SABRELINER:
The Sabreliner data set has 19 header-data-file pairs for 17 flights, among which flight 6 has three header-data-file pairs. Each flight is named ci2_aircraft_flt#_flighttime, where "aircraft" is 'sa' to Sabreliner, flight# is ranging from 01 through 17 for Sabreliner (flight 6 numbers are 06a, 06b, and 06c), and "flighttime" has the format of yymmdd to indicate the date of the flight, e.g., ci2_sa_flt02_911118. The flight name is the same as granule name. The header files are named granule_name.hdr, and the data files are named granule_name.dat.

A header file contains the variable names (or called parameters), and the information regarding sampling rate, scale factors, data size, etc. for the parameters. The data file contains data values of parameters over a specified time period.

Data Format:

The header files are in ASCII format. The data files are in binary format.

9. Data Manipulations:

Formulae:

Derivation Techniques and Algorithms:

...

Data Processing Sequence:

Processing Steps:

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Processing Changes:

...

Calculations:

Special Corrections/Adjustments:

...

Calculated Variables:

...

Graphs and Plots:

Images are not available for these data sets.

10. Errors:

Sources of Error:

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Quality Assessment:

Data Validation by Source:

...

Confidence Level/Accuracy Judgement:

...

Measurement Error for Parameters:

...

Additional Quality Assessments:

...

Data Verification by Data Center:

...

11. Notes:

Limitations of the Data:

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Known Problems with the Data:

...

Usage Guidance:

...

Any Other Relevant Information about the Study:

...

12. Application of the Data Set:

...

13. Future Modifications and Plans:

There are no plans to modify these data sets.

14. Software:

Software Description:

Sample read software is available for these data sets.

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 this data set.

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:

Langley DAAC User and Data Services Office
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Hampton, Virginia 23681-2199
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) that allows to query the Langley DAAC dataset 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 (UDS) 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:

Langley DAAC User and Data Services Office
NASA Langley Research Center
Mail Stop 157D
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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:

There are no output products available at this time.

17. References:

Heymsfield, A.J., et al., 1990. "The 27-28 October 1986 FIRE IFO Cirrus Case Study: Cloud Microstructure," Monthly Weather Review, 118, 2313-2328.

Cox, et al., 1987. "FIRE - The First ISCCP Regional Experiment," Bull. Amer. Meteor. Soc., 68, 114-118.

Starr, D.O'C., 1987. "A Cirrus-Cloud Experiment: Intensive Field Observations Planned for FIRE," Bull. Am. Met. Soc., 68, 119-124.

FIRE Cirrus Intensive Field Observations (IFO) 1986 Operations Plan, October 1986.

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

18. Glossary of Terms:

EOSDIS Glossary.

19. List of Acronyms:

NASA - National Aeronautics Space Administration
URL - Uniform Resource Locator

EOSDIS Acronyms.

20. Document Information:

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Document Curator:

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