SAFARI 2000 JRB AEROCOMMANDER TRACE GAS AND AEROSOL DATA, DRY SEASON 2000

Get Data

Summary:

As part of the dry-season 2000 intensive campaign of SAFARI 2000, the South African Weather Bureau Aerocommander, JRB, flew 19 missions, for a total of 28 separate flights conducted between August 15 and September 7, 2000. JRB, which worked closely with the other Aerocommander, JRA (Piketh et al., 2004), was dedicated to the measurement of trace gas and aerosol properties. A suite of trace gas analyzers (for O_3, SO_2, CO and NO), laser aerosol probes and atmospheric probes were present for all flights.

The data described here include all data collected on the aircraft Data Acquisition System. This is Version 3 (October 2002) of the data.

Other instruments and sampling units present for some of the flights included a nephelometer (Elias), CO flasks (Novelli) for MOPITT validation purposes, and VOC canisters (Piketh) for the collection and characterization of volatile organic compounds present over various land surface types. Data collected using other systems can be obtained from the responsible investigators directly. Their contact information is included in the companion file [https://daac.ornl.gov/daacdata/safari2k/atmospheric/SAWB_JRB/comp/jra_jrb_trace_gas_companion.pdf].

The data files are organized and named by aircraft, date, and daily flight number. The data are stored as ASCII files in comma-separated-value format.

Data Citation:

Cite this data set as follows:

Piketh, S. J., T. Elias, and D. C. Stein. 2004. SAFARI 2000 JRB Aerocommander Trace Gas and Aerosol Data, Dry Season 2000. ORNL DAAC, Oak Ridge, Tennessee, USA. http://dx.doi.org/10.3334/ORNLDAAC/714.

References:

Annegarn, H. J., L. Otter, R. J. Swap, and R. J. Scholes. 2002. Southern Africa's ecosystem in a test tube: A perspective on the Southern African Regional Science Initiative, South African Journal of Science, 98, 111-113.

Piketh, S. J., E. Thierry, and D. C. Stein. 2004. SAFARI 2000 JRA Aerocommander Trace Gas, Aerosol and CCN Data, Dry-Season 2000. Data set. Available on-line [http://www.daac.ornl.gov] from Oak Ridge National Laboratory Distributed Active Archive Center, Oak Ridge, Tennessee, U.S.A.

Swap, R.J., Annegarn, H. J., L. B. Otter. 2002. Southern African Regional Science Initiative (SAFARI 2000): Condensed Science Plan, South African Journal of Science, 98, 119-124.

Swap, R. J., H. J. Annegarn, J. T. Suttles, J. Haywood, M. Helmlinger, C. Hely, P. V. Hobbs, B. N. Holben, J. Ji, M. King, T. Landmann, W. Maenhaut, L. Otter, B. Pak, S. J. Piketh, S. Platnick, J. Privette, D. Roy, A. M. Thompson, D. Ward, and R. Yokelson. 2002. The Southern African Regional Science Initiative (SAFARI 2000): Dry-Season Field Campaign: An Overview, South African Journal of Science, 98, 125-130.

Data Format:

The data files contain trace gas and aerosol property measurements collected from the JRB aircraft. The files are organized and named by aircraft, date, and daily flight number. For example, data file b20000815_1.dat contains data collected on the first flight of the JRB aircraft on August 15, 2000. The data are stored as ASCII files in comma-separated-value format.

The reported values are ten second averages. All parameters were originally recorded on the aircraft Data Acquisition System with a temporal resolution of 1 Hz (i.e., Data acquisition mode -> 0 = 1Hz). No measures of uncertainty are provided (e.g., standard deviation). The average speed of the aircraft during data collection was 100 m s^{-1}. Data have been processed and corrected.

The data described here include all data collected on the aircraft Data Acquisition System. Data collected using other systems can be obtained from the

respective investigators directly.

Data file column headings, units, missing value codes, and variable descriptions.

VARIABLE	UNITS	MISSING DATA	LONGNAME
DATE	UTC	-999	Study date (dd-mm-yyyy)
TIME	UTC	-999	Study time (hh:mm:ss)
mode	none	-999	Data acquisition mode -> 0 = 1Hz and 1 => 10Hz
GLAT	deg_east	-999	GPS latitude (decimal degrees)
GLON	deg_west	-999	GPS longitude (decimal degrees)
GDATE	UTC	-999	GPS date (ddmmyy)
GTIME	UTC	-999	GPS time (hhmmss)
GSPD	m/s	-999	GPS ground speed
GHEAD	deg	-999	GPS heading
GSTAT	none	-999	GPS status
ATBR	degC	-999	Ambient Temperature
RHUM	%	-999	Vaisala humidity
PSBC	hPa	-999	Corrected Static Pressure
TAS	m/s	-999	Derived True Air Speed
ATBF	degC	-999	Ambient Temperature
TAS1	m/s	-999	Derived True Air Speed
GALT	m	-999	NACA Pressure Altitude
ALTF	feet	-999	NACA Pressure Altitude
THETA	K	-999	Potential Temperature
THETAE	K	-999	Equivalent Potential Temperature
THETAV	K	-999	Virtual Potential Temperature
SPHUM	g/kg	-999	Specific Humidity
MR	g/cm^3	-999	Mixing Ratio
RHO	g/cm^3)	-999	Absolute humidity (Vapour Density)
TDEW	degC	-999	Dewpoint Temperature

TVIR	K	-999	Virtual Temperature
PRNG_LWO	none	-999	PCASP-100X range
DBARP_LWO	uM	-999	PCAS-100 mean particle diameter
DISPP_LWO	none	-999	PCAS-100 dispersion (sigma/dbarx)
CONCP_LWO	#/cm^3	-999	PCAS-100 total concentration
CPCAS_LWO_(1-15)	#/cm^3/uM_ival	-999	PCAS-100 corrected concentration
FRNG_LWI	none	-999	FSSP-100 range
CONCF_LWI	#/cm^3	-999	FSSP-100 total concentration
DBARF_LWI	uM	-999	FSSP-100 mean particle diameter
DISPF_LWI	none	-999	FSSP-100 dispersion (sigma/dbarx)
LWCF_LWI	g/cm^3	-999	FSSP-100 Liquid Water Content
CFSSP_LWI_(1-15)	#/cm^3/uM_ival	-999	FSSP-100 corrected concentration
SO2	PPB	-999	S02_Concentration
O3	PPB	-999	O3
CO	PPB	-999	CO_signal
NO	PPB	-999	NO_signal
SO2C	PPB	-999	SO2 Altitude Corrected Concentration
O3C	PPB	-999	O3 Altitude Corrected Concentration
COC	PPB	-999	CO Altitude Corrected Concentration
NOC	PPB	-999	NO Altitude Corrected Concentration

Table Notes:

The variable **'CPCAS_LWO'** has 15 particle concentration values corresponding to a size bin.

This PCASP instrument operated in only one range.

Lower and upper particle site limits (micrometers) for 'CPCAS_LWO' size bins.

Size Bin	Lower Limit (um)	Upper Limit (um)
1	0.10	0.12
2	0.12	0.14
3	0.14	0.17

4	0.17	0.20
5	0.20	0.25
6	0.25	0.30
7	0.30	0.40
8	0.40	0.50
9	0.50	0.70
10	0.70	0.90
11	0.90	1.20
12	1.20	1.50
13	1.50	2.00
14	2.00	2.50
15	2.50	3.00

The variable **'CFSSP_LWI'** has 15 values corresponding to a size bin.

The different instrument operating range values of **'FRNG_LWI'** will determine the bin size limits.

Lower and upper particle site limits (micrometers) for 'CFSSP_LWI' size bins for instrument operating ranges.

	Range 0		Range 1		Range 2		Range 3	
Size Bin	**Lower Limit (um)**	**Upper Limit (um)**	**Lower Limit (um)**	**Upper Limit (um)**	**Lower Limit (um)**	**Upper Limit (um)**	**Lower Limit (um)**	**Upper Limit (um)**
1	2.00	5.00	2.00	4.00	1.00	2.00	0.50	1.00
2	5.00	8.00	4.00	6.00	2.00	3.00	1.00	1.50
3	8.00	11.00	6.00	8.00	3.00	4.00	1.50	2.00
4	11.00	14.00	8.00	10.00	4.00	5.00	2.00	2.50
5	14.00	17.00	10.00	12.00	5.00	6.00	2.50	3.00
6	17.00	20.00	12.00	14.00	6.00	7.00	3.00	3.50
7	20.00	23.00	14.00	16.00	7.00	8.00	3.50	4.00
8	23.00	26.00	16.00	18.00	8.00	9.00	4.00	4.50
9	26.00	29.00	18.00	20.00	9.00	10.00	4.50	5.00
10	29.00	32.00	20.00	22.00	10.00	11.00	5.00	5.50
11	32.00	35.00	22.00	24.00	11.00	12.00	5.50	6.00

12	35.00	38.00	24.00	26.00	12.00	13.00	6.00	6.50
13	38.00	41.00	26.00	28.00	13.00	14.00	6.50	7.00
14	41.00	44.00	28.00	30.00	14.00	15.00	7.00	7.50
15	44.00	47.00	30.00	32.00	15.00	16.00	7.50	8.00

Example Data Records

Example data file (b20000815_1.dat).

DATE,TIME,mode,GLAT,GLON,GDATE,GTIME,GSPD,GHEAD,GSTAT,ATBR,RHUM,PSBC,TAS,
ATBF,TAS1,GALT,ALTF,THETA,THETAE,THETAV,SPHUM,MR,RHO,TDEW,TVIR,PRNG_LWO,
DBARP_LWO,DISPP_LWO,CONCP_LWO,CPCAS_LWO_1,CPCAS_LWO_2,CPCAS_LWO_3,
CPCAS_LWO_4,CPCAS_LWO_5,CPCAS_LWO_6,CPCAS_LWO_7,CPCAS_LWO_8,CPCAS_LWO_9,
CPCAS_LWO_10,CPCAS_LWO_11,CPCAS_LWO_12,CPCAS_LWO_13,CPCAS_LWO_14,
CPCAS_LWO_15,FRNG_LWI,CONCF_LWI,DBARF_LWI,DISPF_LWI,LWCF_LWI,CFSSP_LWI_1,
CFSSP_LWI_2,CFSSP_LWI_3,CFSSP_LWI_4,CFSSP_LWI_5,CFSSP_LWI_6,CFSSP_LWI_7,
CFSSP_LWI_8,CFSSP_LWI_9,CFSSP_LWI_10,CFSSP_LWI_11,CFSSP_LWI_12,CFSSP_LWI_13,
CFSSP_LWI_14,CFSSP_LWI_15,SO2,O3,CO,NO,SO2C,O3C,COC,NOC
15-08-2000,07:28:11,0,-23.861,29.457,150800,72811,0.000,318.000,1,20.593,36.373,902.227,7.113,
20.525,7.112,968.188,3176.469,302.514,0.018,303.629,0.006,0.006,6.504,5.227,294.836,0.000,0.000,
0.000,0.000,0.000,0.000,0.000,0.000,0.000,0.000,0.000,0.000,0.000,0.000,0.000,0.000,0.000,0.000,
0.000,1.000,0.000,0.000,0.000,0.000,0.000,0.000,0.000,0.000,0.000,0.000,0.000,0.000,0.000,0.000,
0.000,0.000,0.000,0.000,0.000,13.916,2.227,321.602,2.267,14.993,2.399,346.484,2.443
15-08-2000,07:28:21,0,-23.861,29.457,150800,72821,0.000,318.000,1,20.621,36.536,902.386,6.807,
20.432,6.804,966.738,3171.712,302.528,0.018,303.650,0.006,0.006,6.544,5.315,294.871,0.000,0.000,
0.000,0.000,0.000,0.000,0.000,0.000,0.000,0.000,0.000,0.000,0.000,0.000,0.000,0.000,0.000,0.000,
0.000,1.000,0.000,0.000,0.000,0.000,0.000,0.000,0.000,0.000,0.000,0.000,0.000,0.000,0.000,0.000,
0.000,0.000,0.000,0.000,0.000,13.718,2.237,325.837,2.296,14.780,2.410,351.074,2.474

Document Information:

(To be completed manually by Document Curator)

2004/3/1

Document Review Date:

2004/3/1

Document Curator:

webmaster@www.daac.ornl.gov

Document URL:

http://daac.ornl.gov