



SMEX03 Aircraft Polarimetric Scanning Radiometer (PSR) Data: Alabama, Oklahoma, Georgia, Version 1

USER GUIDE

How to Cite These Data

As a condition of using these data, you must include a citation:

Jackson, T., R. Bindlish, A. J. Gasiewski, M. Klein, and B. Stankov. 2007. *SMEX03 Aircraft Polarimetric Scanning Radiometer (PSR) Data, Alabama, Version 1*. [Indicate subset used]. Boulder, Colorado USA. NASA National Snow and Ice Data Center Distributed Active Archive Center. doi: <https://doi.org/10.5067/MK0BQ0W0O973>. [Date Accessed].

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Jackson, T., R. Bindlish, A. J. Gasiewski, M. Klein, and B. Stankov. 2013. *SMEX03 Aircraft Polarimetric Scanning Radiometer (PSR) Data, Georgia, Version 1*. [Indicate subset used]. Boulder, Colorado USA. NASA National Snow and Ice Data Center Distributed Active Archive Center. doi: <https://doi.org/10.5067/WRJ9VOHAQX1U>. [Date Accessed].

FOR QUESTIONS ABOUT THESE DATA, CONTACT NSIDC@NSIDC.ORG

FOR CURRENT INFORMATION, VISIT <https://nsidc.org/data/NSIDC-0328> or <https://nsidc.org/data/NSIDC-0560> or <https://nsidc.org/data/NSIDC-0561>



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1 DETAILED DATA DESCRIPTION

This user guide applies to the *SMEX03 Aircraft Polarimetric Scanning Radiometer (PSR) Data, Alabama, Version 1* (NSIDC-0328), *SMEX03 Aircraft Polarimetric Scanning Radiometer (PSR) Data, Georgia, Version 1* (NSIDC-0560), and *SMEX03 Aircraft Polarimetric Scanning Radiometer (PSR) Data, Oklahoma, Version 1* (NSIDC-0561) data sets, all of which are available through the NASA National Snow and Ice Data Center Distributed Active Archive Center (NSIDC DAAC).

1.1 Format

Data are provided as ASCII text files. Table 1 describes the format of the processed data files. Table 2 describes the format of the raw data files.

Table 1: Column Descriptions for Processed Data Files

Column	Description
Column 1	UTM - Northing
Column 2	UTM - Easting
Column 3	C-band (7.32 GHz) V
Column 4	C-band (7.32 GHz) H
Column 5	X-band (10.7 GHz) H

Table 2: Column Descriptions for Raw Data Files

Column	Description
Column 1	UTM - Northing
Column 2	UTM - Easting
Column 3	Latitude
Column 4	Longitude
Column 5	C-band (7.32 GHz) V
Column 6	C-band (7.32 GHz) H
Column 7	X-band (10.7 GHz) H

1.2 File and Directory Structure

Data are organized in directories based on study area (AL = Alabama, GA = Georgia, LW = Little Washita, ON = Oklahoma North, OS = Oklahoma South). Within each study area directory are a processed and a raw directory. The processed directories contain gridded brightness temperatures. The raw directories contain the raw brightness temperature observations.

1.3 File Naming Convention

The processed files are named according to the following convention.

SSMDD.txt

Where

SS	= study area (AL=Alabama, GA=Georgia,LW = Little Washita, ON = Oklahoma North, OS = Oklahoma South)
M	= month
DD	= day

The raw files are named according to the following convention.

PPPMDD##.txt

where

PPPP	= processing level (L23i)
M	= month
DD	= day
##	= 2 digit number

1.4 Spatial Coverage

Table 3 lists the spatial coverage of each study area. All locations are UTM zone 14 in NAD83/WGS84 datum.

Table 3: Spatial Coverage

	Easting	Northing	Latitude	Longitude
Alabama Regional Area				
Upper Left	492000	3894600	35.194353404	-87.087877924
Upper Right	612000	3894600	35.188137035	-85.769834626
Lower Right	492000	3837000	34.674943785	-87.087325703
Lower Left	612000	3837000	34.668845602	-85.777562595
Georgia Regional Area				
Upper Left	219000	3532200	31.890956391	-83.970846870
Upper Right	219000	3429000	30.961064855	-83.941646829
Lower Right	274200	3429000	30.972927502	-83.364252777
Lower Left	274200	3532200	31.903257457	-83.387736190
Oklahoma Little Washita Watershed				
Upper Left	219000	3532200	31.890956391	-83.970846870
Upper Right	219000	3429000	30.961064855	-83.941646829
Lower Right	274200	3429000	30.972927502	-83.364252777
Lower Left	274200	3532200	31.903257457	-83.387736190
Oklahoma North Regional Area				
Upper Left	585800	4081000	36.871048244	-98.037331796
Upper Right	641000	4081000	36.864419443	-97.418165280
Lower Right	641000	3997000	36.107428397	-97.433484464
Lower Left	585800	3997000	36.113877589	-98.046657639
Oklahoma South Regional Area				
Upper Left	560400	3920100	35.422485463	-98.334661234
Upper Right	618000	3920100	35.417323871	-97.700276141
Lower Right	618000	3812100	34.443677450	-97.715544713
Lower Left	560400	3812100	34.448656578	-98.342479279

1.5 Temporal Coverage

Measurements were collected from 25 June through 17 July 2003 in the study areas. Table 4 lists the collection dates for each area.

Table 4: PSR Collection Dates

Location	Dates
Alabama	25, 27, 29, 30 June 2 July
Georgia	25, 29, 30 June
Little Washita	3, 5, 7, 10, 17 July
Oklahoma North	3, 5, 7, 10, 11, 12, 13, 14, 15, 17 July
Oklahoma South	2, 3, 5, 7, 10, 12, 13, 14, 15, 17 July

Data collection was timed to coincide with a 3 hour window centered on the Aqua equatorial overpass time of 13:30 LST.

1.6 Parameter or Variable

1.6.1 Parameter Description

Parameters in this data set are brightness temperatures for the C-band (7.32 GHz) V and H and for the X-band (10.7 GHz) H. Observations at the X-band (10.7 GHz) V are not available due to calibration problems.

1.6.2 Sample Data Record

The following sample shows the first 5 rows from the AL processed file AL625.txt:

492400.00	3837400.00	219.43	162.01	141.87
492400.00	3838200.00	228.56	179.60	170.85
492400.00	3839000.00	244.36	203.46	204.96
492400.00	3839800.00	263.28	230.38	238.26
492400.00	3840600.00	282.41	237.52	260.28

The following sample shows the first 5 rows from the ON raw file L23i70309.txt:

644800.09	3988427.31	36.029610	-97.392853	288.69	280.04	282.86
644817.33	3988714.13	36.032192	-97.392609	0.00	280.38	285.14
644829.49	3989145.96	36.036082	-97.392395	289.11	279.82	284.52
644821.09	3989534.40	36.039584	-97.392417	289.32	280.10	286.49

644796.85	3989932.68	36.043177	-97.392613	289.48	280.16	285.24
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2 DATA ACQUISITION AND PROCESSING

2.1 Derivation Techniques and Algorithms

PSR/CX raw data goes through several processing steps. Quality control, time synchronization, calibration, rasterization, and georegistration are considered preprocessing. Following this are removing of Radio Frequency Interference (RFI), adjusting for temporal variations inherent in mapping a large region with an aircraft sensor, and resampling the data to a standard grid that facilitates multitemporal analysis and integration with ancillary data bases for algorithm applications (Jackson et al. 2005).

Grid Resampling

The PSR/CX data consist of beam positions for sequential conical scans. Each beam position footprint is about 3 km in size. Due to sampling rates, the spacing between these footprints is 300 m, which results in over sampling. In addition, each line of data overlaps other lines. In order to produce a data set that can be integrated in further analyses, all the footprint data were used in a kriging-based grid resampling procedure. The output grid selected was 800 m, which matched the nominal field scale in the regions as well as the resolution of other databases. Each channel of data was resampled independently (Jackson et al. 2005).

2.2 Sensor or Instrument Description

The PSR/CX band instrument was integrated onto the NASA Wallops Flight Facility (WFF) P3B aircraft in the aft portion of the bomb bay and flown over the regional and watershed areas. The PSR scans at a constant incidence angle of 55° with a swath width of 19 km. The flight line has a spacing of 11 km and a length of 80 km. Four regional flight lines at an altitude of ~8000 m were flown over AL, GA, ON, and OS. Two watershed flight lines at an altitude of ~3000 m covered the LW watershed area. The P3 was deployed out of Huntsville, Alabama from 25 June to 2 July 2003 and out of Oklahoma City, Oklahoma from 2 July to 17 July 2003.

3 REFERENCES AND RELATED PUBLICATIONS

Jackson, T. J., R. Bindlish, A. J. Gasiewski, B. Stankov, M. Klein, E. G. Njoku, D. Bosch, T. L. Coleman, C. Laymon, and P. Starks. 2005. Polarimetric Scanning Radiometer C and X-band microwave observations during SMEX03. *IEEE Transactions on Geosciences and Remote Sensing* 43:2418-2430.

Please see the [USDA SMEX03](#) Web site for in depth information on the science mission and goal of the SMEX project.

Related Data Collections

[AMSR-E/Aqua Data at NSIDC](#): AMSR-E standard products available at NSIDC.

4 CONTACTS AND ACKNOWLEDGMENTS

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5 DOCUMENT INFORMATION

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5.2 Date Last Updated

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