

Search ORNL DAAC

Search

[DAAC Home](#) > [Get Data](#) > [NASA Projects](#) > [Arctic-Boreal Vulnerability Experiment \(ABOVE\)](#) > [User guide](#)

ABOVE: L1 S-0 Polarimetric Data from UAVSAR P-band SAR, Alaska and Canada, 2017

Get Data

Documentation Revision Date: 2021-04-03

Dataset Version: 1

Summary

This dataset provides Level 1 (L1) polarimetric radar backscattering coefficient (Sigma-0 or S-0), multi-look complex, polarimetrically calibrated, and georeferenced data products from the UAVSAR P-band SAR radar instrument collected over 74 study sites across Alaska, USA, and western Canada. The radar instrument is a fully polarimetric P-band (ultra-high frequency) SAR operating in the 420-440 MHz band. The flight campaigns took place periodically in May-August 2017 onboard a NASA Gulfstream-III aircraft. Each set of products was produced from a data take (i.e., acquisition) of the UAVSAR P-band SAR radar instrument, where one data take is equivalent to one flight line over a site. Two to four data takes were sought for each site, although for some sites as few as one or as many as six are provided. There were a total of 139 data takes over the 74 sites.

The UAVSAR P-band radar instrument was originally developed for the Airborne Microwave Observatory of Subcanopy and Subsurface (AirMOSS) campaign to measure root-zone soil moisture. The data can be used for subsurface and sub-canopy imaging applications such as monitoring soils, forest, and permafrost changes, and detecting underground structures and subsurface changes.

Products for each of the 139 data takes are provided in a separate directory. Each directory contains 38 data products of several types, for a total of 5,282 data files. The data products are provided at two resolutions, 0.5 arcseconds (about 15 meters) and 3.0 arcseconds (about 90 meters), which are denoted in each file name.

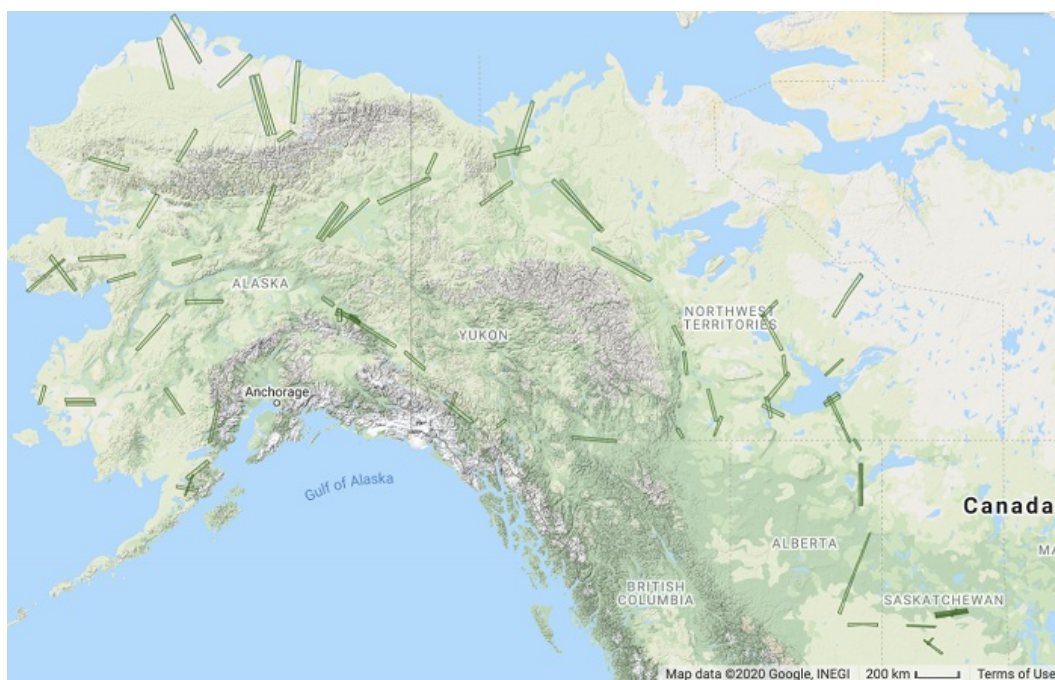


Figure 1. UAVSAR P-band SAR radar swaths over study sites across Alaska, USA, and western Canada for the 2017 ABOVE campaign.

Citation

Shimada, J.G., Y. Lou, S. Hensley, B.P. Hawkins, L. Harcke, D.M. Lagoy, T.R. Michel, R.J. Muellerschoen, S. Flores, N. Pinto, C. Rains, W.W. Tung, and Y. Zheng. 2021. ABOVE: L1 S-0 Polarimetric Data from UAVSAR P-band SAR, Alaska and Canada, 2017. ORNL DAAC, Oak Ridge, Tennessee, USA. <https://doi.org/10.3334/ORNLDAAC/1800>

Table of Contents

1. [Dataset Overview](#)
2. [Data Characteristics](#)
3. [Application and Derivation](#)
4. [Quality Assessment](#)
5. [Data Acquisition, Materials, and Methods](#)

1. Dataset Overview

This dataset provides Level 1 (L1) polarimetric radar backscattering coefficient (Sigma-0 or S-0), multi-look complex, polarimetrically calibrated, and georeferenced data products from the UAVSAR P-band SAR radar instrument collected over 74 study sites across Alaska, USA, and western Canada. The radar instrument is a fully polarimetric P-band (ultra-high frequency) SAR operating in the 420–440 MHz band. The flight campaigns took place periodically in May–August 2017 onboard a NASA Gulfstream-III aircraft. Each set of products was produced from a data take (i.e., acquisition) of the UAVSAR P-band SAR radar instrument, where one data take is equivalent to one flight line over a site. Two to four data takes were sought for each site, although for some sites as few as one or as many as six are provided. There were a total of 139 data takes over the 74 sites.

The UAVSAR P-band radar instrument was originally developed for the Airborne Microwave Observatory of Subcanopy and Subsurface (AirMOSS) campaign to measure root-zone soil moisture. The data can be used for subsurface and sub-canopy imaging applications such as monitoring soils, forest, and permafrost changes, and detecting underground structures and subsurface changes.

Project: [Arctic-Boreal Vulnerability Experiment](#)

The Arctic-Boreal Vulnerability Experiment (ABoVE) is a NASA Terrestrial Ecology Program field campaign based in Alaska and western Canada between 2016 and 2021. Research for ABoVE links field-based, process-level studies with geospatial data products derived from airborne and satellite sensors, providing a foundation for improving the analysis and modeling capabilities needed to understand and predict ecosystem responses and societal implications.

Related Datasets

Chapin, E., S. Flores, L. Harcke, B. P. Hawkins, S. Hensley, T. R. Michel, R. J. Muellerschoen, J. G. Shimada, W. W. Tung, and C. Veeramachaneni. 2018. AirMOSS: L1 S-0 Polarimetric Data from AirMOSS P-band SAR, BERMS, Canada, 2012-2015. ORNL DAAC, Oak Ridge, Tennessee, USA. <https://doi.org/10.3334/ORNLDAAC/1406>

Lou, Y., J. G. Shimada, T. R. Michel, R. J. Muellerschoen, Y. Zheng, and M. Moghaddam. 2019. Pre-ABoVE: L1 S-0 Polarimetric Data from AirMOSS P-band SAR, Alaska, 2014-2015. ORNL DAAC, Oak Ridge, Tennessee, USA. <https://doi.org/10.3334/ORNLDAAC/1678>

Acknowledgments

This work was funded by the NASA Earth Science Division.

2. Data Characteristics

Spatial Coverage: Alaska, USA, and western Canada

ABoVE Reference Locations

Domain: Core ABoVE

State/Territory: Alaska; Canada

Grid Cells (92): Bh001v002, Bh001v003, Bh001v006, Bh002v002, Bh002v003, Bh002v005, Bh002v006, Bh003v001, Bh003v002, Bh003v003, Bh003v004, Bh003v005, Bh003v006, Bh004v001, Bh004v002, Bh004v003, Bh004v004, Bh004v005, Bh005v001, Bh005v002, Bh005v003, Bh005v004, Bh006v001, Bh006v002, Bh006v003, Bh006v004, Bh006v005, Bh006v006, Bh006v007, Bh006v008, Bh006v009, Bh007v001, Bh007v002, Bh007v003, Bh007v004, Bh007v005, Bh007v006, Bh007v007, Bh007v008, Bh007v009, Bh008v001, Bh008v002, Bh008v003, Bh008v004, Bh008v005, Bh008v009, Bh008v010, Bh009v002, Bh009v005, Bh009v006, Bh009v010, Bh009v011, Bh010v005, Bh010v006, Bh010v007, Bh010v008, Bh010v011, Bh011v005, Bh011v006, Bh011v007, Bh011v008, Bh011v009, Bh011v010, Bh011v011, Bh011v012, Bh012v010, Bh012v011, Bh012v012, Bh012v015, Bh012v016, Bh013v009, Bh013v010, Bh013v011, Bh013v012, Bh013v013, Bh013v014, Bh013v015, Bh013v016, Bh013v017, Bh014v009, Bh014v010, Bh014v011, Bh014v012, Bh014v013, Bh014v014, Bh014v015, Bh014v017, Bh014v018, Bh015v009, Bh015v016, Bh015v017, Bh015v018

Spatial Resolution: 0.5 arcseconds and 3.0 arcseconds

Temporal Coverage: Periodic flights from May 2017–August 2017.

Temporal Resolution: Daily

Study Area: Latitudes and longitudes are provided in decimal degrees.

Sites	Westernmost Longitude	Easternmost Longitude	Northernmost Latitude	Southernmost Latitude
Alaska and western Canada	-114.052479	-104.183584	71.464621	52.077702

Data File Information

There are 38 data products (of several formats) for each of 139 data takes, totaling 5,282 data files. The data products are provided at two resolutions, 0.5 arcseconds (about 15 m) and 3.0 arcseconds (about 90 m).

Files with the extensions .ann, .h5, .hgt, .inc, .jpg, .kmz, .png, and .slope are named `ssssss_LLLLL_FFFF_CCC_YYMMDD_PL090ffww_gg_CX_vv.ext` (e.g., `tukhwy_01812_17057_014_170606_PL09043020_05_CX_01.ann`).

Files with the extension .grd and .mlc are named `ssssss_LLLLL_FFFF_CCC_YYMMDD_PL090ffww_ggpppp_CX_vv.ext` (e.g., `tukhwy_01812_17057_014_170606_PL09043020_30HVVV_CX_01.mlc`).

Table 1. File name elements and descriptions.

Element	Short Name	Example Value	Description
ssssss	Site name	padeIE	6-character alphanumeric identifier assigned to each ABoVE flight line For sites with a single flight line, the 6 characters identify the site, whereas sites with multiple flight lines have 5 characters to identify the flight line followed by a letter (N, S, E, W, A, B, C, D) that identifies the flight line within the site

LLLLL	Flight line ID	00026	5-character flight line identifier, where the first 3 characters are the aircraft heading in integer degrees (range 000–359) and the last 2 characters are from an alphanumeric counter to ensure uniqueness
FFFFF	Flight ID	17051	5-digit flight identifier, where the first 2 digits are the last 2 digits of the flight year and the following 3 digits are from a numeric counter to ensure uniqueness
CCC	Data take counter	009	3-digit data take counter for the flight (range 0-9); a first digit of 0 indicates that the data take was collected using automatic mode, while a first digit of 1 indicates that it was collected using manual mode; usually, the data take counter starts at 000 for the first science data take of a flight and is incremented by 1 for each successive science data take; since the radar system may reinitialize the counter if a system reset occurs during flight, the data take counter may not be unique for a flight
YYMMDD	Flight date	170522	UTC date at the start of the data take, where YY is the last two digits of the flight year, MM is the month of the year, and DD is the day of the month
PL09043020	Radar mode		10-character alphanumeric identifier; see Table 3 for the naming convention
gg	Spatial resolution	30	2-digit grid spacing in integer units of 0.1 arcseconds, where 05 represents 0.5" and 30 represents 3.0"
pppp	Cross product abbreviation	HHHV	Formed from the subscripts of the two factors of the cross products as read from left to right (e.g., the abbreviation for the cross product $S_{HH}S^*_{HV}$ is HHHV), where values are HHHH, HHHV, HHVV, HVHV, HVVV, and VVVV
CX	Crosstalk removal status	CX	2-character crosstalk removal status; the value is CX when crosstalk has been removed and XX when crosstalk has not been removed; ABoVE L1-S-0 data products use the value CX only
vv	Version number	01	2-digit product version number starting at 01; the version number is incremented by 1 when a product is redelivered
ext	Extension	ann	File format extension

Table 2. Six-letter abbreviations for study sites. Some sites contain subsites (identified in parentheses) and multiple data takes.

Site Abbreviation	Site Name
aklavi	Aklavik Ice Road, NT, Canada
ambler	Ambler permafrost borehole site, AK, USA
anakt (E,W)	Anaktuvuk Pass, AK, USA
atqasu	Atqasuk permafrost borehole site, AK, USA
barrow	Barrow permafrost borehole site, AK, USA
behcho	Behchoko, NT, Canada
berms (A,B,C,D)	Boreal Ecosystem Research and Monitoring Sites (BERMS), SK, Canada
chevak	Chevak, AK, USA
coldfo	Coldfoot permafrost borehole site, AK, USA
counci	NGEE Arctic site, Council, AK, USA
daring	Daring Lake, NT, Canada
deltj (A,B,C)	Delta Junction, AK, USA
dhorse	Deadhorse permafrost borehole site, AK, USA
djNEON	Delta Junction NEON site, AK, USA
faberl	Faber Lake, NT, Canada
fliard	Fort Liard, NT, Canada
fsmit (N,S)	Fort Smith, NT, Canada
ftmacm	Fort McMurray, AB, Canada
ftres (N,S)	Fort Resolution, NT, Canada
ftyuko	Fort Yukon, AK, USA
gdhope	Fort Good Hope, NT, Canada
huslia	Huslia permafrost borehole site, AK, USA
inigok	Circumpolar Active Layer Monitoring (CALM) site, Inigok, AK, USA
innoko	Innoko River, AK, USA
ivotuk	Ivotuk permafrost borehole site, AK, USA
kakis (A,B)	Kakisa Lake, NT, Canada
katma (A,B,C)	Katmai National Park and Preserve, AK, USA
kluan (A,B)	Kluane National Park and Reserve, YT, Canada
kougar	Kougarok permafrost borehole site, AK, USA

koyukk	Koyuk permafrost borehole site, AK, USA
lclark	Lake Clark National Park and Preserve, AK, USA
lloydE	East of Lloydminster, SK, Canada (also AirSWOT study site)
lloydW	West of Lloydminster, AB, Canada (also AirSWOT study site)
mcpher	Fort McPherson, NT, Canada
noatak	Noatak National Preserve, AK, USA
nwells	Norman Wells, NT, Canada
oldcr (A,B)	Old Crow, YT, Canada
padel (E,W)	Peace–Athabasca Delta, AB, Canada
poorma	Poorman, AK, USA
provid	Fort Providence, NT, Canada
redber	Redberry, SK, Canada (also AirSWOT study site)
saska (N,S)	Saskatoon, SK, Canada (also AirSWOT study site)
scoaoi	Sambaa K'e (formerly Trout Lake), NT, Canada
scotty	Scotty Creek, NT, Canada
snagyk	Snag, YT, Canada
snarer	Snare River, NT, Canada
sriver	Stony River, AK, USA
teller	Teller NGEE Arctic site, AK, USA
toolik	Toolik Lake and Field Station, AK, USA
tukhwy	Inuvik–Tuktoyaktuk Highway, NT, Canada
watson	Watson Lake, YT, Canada
wolfcr	Wolf Creek Trail, YT, Canada
wrigl (N,S)	Wrigley, NT, Canada
yellow	Yellowknife, NT, Canada
yflat (E,W)	Yukon Flats National Wildlife Refuge, AK, USA
ykdel (A,B)	Yukon Delta National Wildlife Refuge, AK, USA

Table 3. Radar mode naming convention elements.

Element	Short Name	Description
P	Radar band	Radar band; 1-character fixed value <i>P</i> for these products
L	Radar look direction	Left-looking radar relative to the direction of flight; 1-character fixed value <i>L</i> for these products
090	Squint angle	Squint angle in integer degrees; 3-digit fixed value <i>090</i> for these products
430	Chirp frequency	Chirp center frequency in MHz; 3-digit fixed value <i>430</i> for these products
20	Chirp bandwidth	Chirp bandwidth in MHz; 2-digit fixed value of <i>20</i> for these products; the value has been rounded for use in the filenames, while the true value is provided in the <i>Bandwidth</i> field of the associated ANN files

Table 4. Data product file extensions. See Section 5 for additional information.

Element	Number of Files per Data Take	Description
ann	2 files: 1 for the 0.5 arcsecond grid spacing and 1 for 3.0 arcsecond	Annotation (text) files containing metadata including filenames, file dimensions, grid coordinates, and radar processing parameters
grd	12 files: 6 for the 0.5 arcsecond grid spacing and 6 for 3.0 arcsecond	Georeferenced/gridded data (GRD) generated by projecting (slant-range) single-look complex data to ground range using the backward projection method
h5	2 files: 1 for the 0.5 arcsecond grid spacing and 1 for 3.0 arcsecond	Hierarchical Data Format Version 5 (HDF5) files containing copies of the DEM, GRD, INC, MLC, and SLOPE
hgt	2 files: 1 for the 0.5 arcsecond grid spacing and 1 for 3.0 arcsecond	Digital elevation map (DEM) used during processing; co-registered to the GRD
inc	2 files: 1 for the 0.5 arcsecond grid spacing and 1 for 3.0 arcsecond	Local incidence angle (INC); co-registered to the GRD
jpg	2 files: 1 for the 0.5 arcsecond grid	Browse thumbnails in JPEG media format produced from the PNG

	spacing and 1 for 3.0 arcsecond	
kmz	2 files: 1 for the 0.5 arcsecond grid spacing and 1 for 3.0 arcsecond	Compressed Keyhole Markup Language (KMZ) files containing the GRD rendered as low-resolution color images for display in Google Earth
mlc	12 files: 6 for the 0.5 arcsecond grid spacing and 6 for 3.0 arcsecond	Multi-looked complex (MLC) cross products
png	2 files: 1 for the 0.5 arcsecond grid spacing and 1 for 3.0 arcsecond	Portable Network Graphics (PNG) images of the KMZ
slope	2 files: 1 for the 0.5 arcsecond grid spacing and 1 for 3.0 arcsecond	Terrain slope (SLOPE) derived from the DEM in the east and north directions

3. Application and Derivation

The Level 1 (L1) Sigma-0 (S-0) data generated by the UAVSAR P-Band SAR radar instrument were used to generate other, higher-level, data products.

4. Quality Assessment

The radar backscatter data has been radiometrically calibrated using 2.4 m and 4.8 m trihedral corner reflectors deployed at the Rosamond Dry Lake in California and receiver data from a noise diode built-in test (BIT) (Chapin et al., 2015). For 2017, the noise diode BIT data were used to improve the antenna pattern. Use of the noise diode BIT data reduced the standard deviations of the 4.8 m corner reflector residuals (observed - predicted radar cross-sections) from 0.867 dB to 0.543 dB for the HH factor of the cross product and from 0.668 dB to 0.521 dB for the VV factor of the cross product. For the 2.4 m corner reflector residuals, the corresponding improvements in the standard deviations were from 0.861 dB to 0.564 dB for HH and from 0.599 dB to 0.436 dB for VV.

For P-band data acquired starting in 2017, noise diode BIT data acquired immediately before and/or after each data take was used to radiometrically correct the data during processing. Crosstalk removal was applied to the data prior to phase calibration (Fore et al., 2015). Adaptive RFI removal has been applied to each data take on an as-needed basis (Harcke and Le, 2014). Its application has been documented in the associated ANN files for each product. RFI that could not be removed by this process has been noted in the *Comments* field of the associated ANN files.

5. Data Acquisition, Materials, and Methods

The UAVSAR P-band SAR instrument used for the 2017 ABoVE flights was the same instrument used during the AirMOSS campaign described at <https://airmoss.ornl.gov/documentation.html>. The radar instrument can penetrate through substantial vegetation canopies and soil to depths of approximately 1.2 m below the surface. All ABoVE data takes that were acquired for standard science data processing were collected using a single chirp waveform having a center frequency of 430 MHz and a 10 dB bandwidth of 20 MHz (Table 3).

The products provided in this dataset have substantial overlap with the UAVSAR standard Polarimetric synthetic aperture (PolSAR) products. Much of the material in this section has been adapted from the online UAVSAR polarimetric product documentation available at <http://uavsar.jpl.nasa.gov/science/documents/polsar-format.html>.

A L1 S-0 polarimetric product consists of a set of files that are generated from a single data take of the radar instrument. The products are output at grid spacings of 0.5" (arcseconds; about 15 m) and 3.0" (about 90 m).

ANN Files

The annotation files (*.ann) contain the metadata for each data take, including filenames, file dimensions, grid coordinates, and radar processing parameters. The annotation files do not conform to any of the standard metadata file formats but use a simple keyword = value ASCII text file format with a maximum of one keyword per line. Each line is terminated by a carriage return (i.e., newline). Unit specifications, if present, are placed within a single pair of parentheses to the left of the equals sign. At least one space should separate the right parenthesis of the unit specification and the equals sign. Two ANN files are generated, one for the 0.5" grid spacing and one for the 3.0" grid spacing.

DEM Files

The digital elevation map (*.dem) files contain the terrain height values that were used to produce the GRD data in the same geographic coordinates. Each sample is a 4-byte real single-precision floating-point number with little-endian byte ordering and units of meters. Two DEM files are generated for each data take, one for the 0.5" grid spacing and one for the 3.0" grid spacing. Each DEM file is co-registered to the GRD files of the same grid spacing.

The following keywords in the associated ANN files provide information about the source DEM used for processing:

- DEM Used in Ground Projection
- DEM Datum
- DEM Source
- DEM Original Pixel Spacing

GRD Files

The georeferenced/gridded data (*.grd) files are generated by projecting the (slant range) SLC data to ground-range using the backward projection method. An equiangular grid is defined with latitude and longitude boundaries that cover the entire slant range image. For each point on the ground range grid, the corresponding location is calculated within the SLC image. The data value closest to this location is assigned to the point on the ground range grid. One GRD file is produced for each of the six cross products (i.e., cross product abbreviations in Table 2) of the MLC files.

Each GRD file has the same sample data type (complex or real) as that of the corresponding MLC cross product. Each sample has units of linear, not dB, radar power. Samples within a record are ordered by increasing longitude (i.e., west to east), and records within a file are ordered by descending latitude (i.e., north to south).

The following keywords in the associated ANN files can be used to determine the geographic location of the GRD files:

- `grd_mag.set_rows` = number of records in GRD file
- `grd_mag.set_cols` = number of samples per record
- `grd_mag.row_mult` = GRD latitude pixel spacing
- `grd_mag.col_mult` = GRD longitude pixel spacing
- `grd_mag.row_addr` = center latitude of the upper-left pixel of the image
- `grd_mag.col_addr` = center longitude of the upper-left pixel of the image

HDF5 Files

The Hierarchical Data Format Version 5 (*.h5) files contain copies of the ground-range products, specifically the DEM, GRD, INC, MLC, and SLOPE.

Incidence Angle

The incidence angle (*.inc) files contain the local incidence angle at each point in the GRD files. Each sample is a 4-byte real single-precision floating-point number with little-endian byte ordering and units of radians. Two incidence angle files are generated for each data take, one for the 0.5" grid spacing and one for the 3.0" grid spacing. Each incidence angle file is co-registered to the GRD files of the same grid spacing.

In the figure below, the local incidence angle θ_i is the angle between the surface normal \hat{n} and the radar line of sight \hat{l} , specifically

$$\theta_i = \cos^{-1}(-\hat{n} \cdot \hat{l})$$

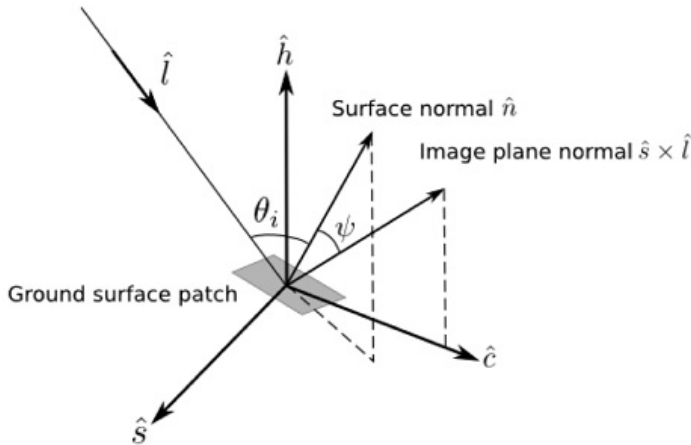


Figure 2. Geometry and formula for calculation of local incidence angle.

KMZ Files

The compressed Keyhole Markup Language (*.kmz) files contain the GRD data rendered as color images. These files can be displayed in Google Earth. Two KMZ files are generated for each data take, one for the 0.5" grid spacing and one for the 3.0" grid spacing.

The color scaling of an image depends upon the dynamic range of the particular source dataset; no absolute color scale exists for the KMZ imagery. The images use the following color mappings:

- Red = $S_{HH}S_{HH}^*$
- Green = $S'_{HV}S'^*_{HV}$
- Blue = $S_{VV}S_{VV}^*$

MLC and SLC Files

The multi-looked complex (*.mlc) cross products are generated by first calculating six cross products from each set of single-look complex (SLC) files using the following equations:

$$\begin{aligned} S_{HH}S_{HH}^* \\ S_{HH}S'^*_{HV} \\ S_{HH}S_{VV}^* \\ S'_{HV}S'^*_{HV} \\ S'_{HV}S_{VV}^* \\ S_{VV}S_{VV}^* \end{aligned}$$

where S'_{HV} is the symmetrized cross-polarization, defined as

$$S'_{HV} = 0.5(S_{HV} + mS_{VH} e^{i\phi})$$

$$m = \text{cross-polarization magnitude correction} = \sqrt{\sum S_{HV}^2 / \sum S_{VH}^2}$$

$$\phi = \text{cross-polarization phase correction} = \text{phase}(\sum S_{HV}S_{VH}^*)$$

Each cross product is then multi-looked (averaged) in both the range and the azimuth dimensions. The cross products are output at grid spacings of approximately 0.5" and 3.0" with separate files written for each combination of cross product and grid spacing. Thus, 12 MLC files are produced for each chirp waveform used during the data take and each summation has been performed over all samples in the respective SLC file.

Each MLC file is a pure binary file with a fixed record length, no header or trailer records, and no prefix or suffix data within each record. The projection of the data is the natural slant range projection. Samples within a record are ordered by increasing range, and records are ordered by increasing azimuth.

The six files produced for a given chirp waveform and grid spacing have the same record length. For the $S_{HH}S_{HH}^*$, $S'_{HV}S'^*_{HV}$, and $S_{VV}S_{VV}^*$ cross products, each sample within a record is a 4-byte real single-precision floating-point number with little-endian byte ordering and units of linear, not dB, radar power. For the $S_{HH}S'^*_{HV}$, $S_{HH}S_{VV}^*$, and $S'_{HV}S_{VV}^*$ cross products, each sample within a record is an 8-byte complex single-precision floating-point number with little-endian byte ordering and units of linear, not dB, radar power.

The following keywords in the associated ANN files can be used to determine the geographic location of the MLC files:

- set_plat = peg latitude
- set_plon = peg longitude
- set_phdg = peg heading
- mlc_mag.row_addr = along-track offset to upper left pixel
- mlc_mag.col_addr = cross-track offset to upper left pixel

The following keywords in the associated ANN files provide the number of looks used to generate the MLC files:

- Number of Range Looks in MLC
- Number of Azimuth Looks in MLC

Twelve MLC files are generated for each data take, six for the 0.5" grid spacing and six for the 3.0" grid spacing. Because of the large data volume and low demand, SLC data are not included in this dataset.

PNG and JPG Files

The Portable Network Graphic (*.png) files contain the images from the KMZ files. Two PNG files are generated for each data take, one for the 0.5" grid spacing and one for the 3.0" grid spacing.

JPG files were created from the PNG files to provide thumbnail (i.e., preview) images.

SLOPE Files

The terrain slope (*.slope) files contain the derivatives of the DEM files in the east and north directions. Each slope value is a unitless 4-byte real single-precision floating-point number with little-endian byte ordering. Two terrain slope files are generated for each data take, one for the 0.5" grid spacing and one for the 3.0" grid spacing. Each sample within a file consists of two values; the first is the terrain slope in the east direction and the second is the slope in the north direction. Each terrain slope file is co-registered to the GRD files of the same grid spacing.

6. Data Access

These data are available through the Oak Ridge National Laboratory (ORNL) Distributed Active Archive Center (DAAC).

[ABoVE: L1 S-0 Polarimetric Data from UAVSAR P-band SAR, Alaska and Canada, 2017](#)

Contact for Data Center Access Information:

- E-mail: uso@daac.ornl.gov
- Telephone: +1 (865) 241-3952

7. References

Chapin, E., B.P. Hawkins, L. Harcke, S. Hensley, Y. Lou, T.R. Michel, L. Moreira, R.J. Muellerschoen, J.G. Shimada, K.W. Tham, and M.C. Tope. 2015. Improved absolute radiometric calibration of a UHF airborne radar. 2015 IEEE Radar Conference (RadarCon), Cincinnati, OH. Pp. 1720-1724. <https://doi.org/10.1109/RADAR.2015.7131276>

Harcke, L.J., and C.T.-C. Le. 2014. AirMOSS P-band RF interference experience. 2014 IEEE Radar Conference (RadarCon), Cincinnati, OH. Pp. 0761-0764. <https://doi.org/10.1109/RADAR.2014.6875691>

Fore, A.G., B.D. Chapman, B.P. Hawkins, C.E. Jones, T.R. Michel, and R.J. Muellerschoen. 2015. UAVSAR Polarimetric Calibration. IEEE Transactions on Geoscience and Remote Sensing 53(6):3481–3491. <https://doi.org/10.1109/TGRS.2014.2377637>

Muellerschoen, R.J. 2017. The Rosamond Corner Reflector Array for SAR calibration; Past, Present, Future. Proceedings of the CEOS SAR Calibration and Validation Workshop, Pasadena, CA.



[Privacy Policy](#) | [Feedback](#) | [Help](#)

Home

About Us

Mission
Data Use and Citation Policy
User Working Group
Partners

Get Data

Science Themes
NASA Projects
All Datasets

Submit Data

Submit Data Form
Data Scope and Acceptance
Data Authorship Policy
Data Publication Timeline
Detailed Submission Guidelines

Tools

MODIS
THREDDS
SDAT
Daymet
CARVE Data Viewer
Soil Moisture Visualizer
Land - Water Checker

Resources

Learning
Data Management
News

Contact Us