



High Mountain Asia Langtang Snow Properties, Version 1

USER GUIDE

How to Cite These Data

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

Tsay, S. 2019. *High Mountain Asia Langtang Snow Properties, Version 1*. [Indicate subset used].
Boulder, Colorado USA. NASA National Snow and Ice Data Center Distributed Active Archive
Center. <https://doi.org/10.5067/VWBLZDUZSTK2>. [Date Accessed].

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

FOR CURRENT INFORMATION, VISIT https://nsidc.org/data/HMA_Snowfield



National Snow and Ice Data Center

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1 DATA DESCRIPTION

This data set is closely related to *High Mountain Asia Langtang Shortwave Downward Irradiance*, *High Mountain Asia Langtang Snow Bidirectional Reflectance Factor*, and *High Mountain Asia Langtang Automatic Weather Station Measurements*. All of these data sets feature point measurements that were collected on or near the Yala Glacier in Nepal.

1.1 Parameters

The parameters provided in this data set are snow reflectance at 1310 nm, snow specific surface area, and snow optical mean radius. The parameters are described in Table 1.

Table 1. Parameter Information

Column # in ASCII file	Parameter Description	Units
1	Profile index: 1 = 0 to 5 cm; 2 = 5 to 10 cm; 3 = 10 to 15 cm; 4 = 15 to 20 cm; etc.	-
2	Sample signal	mV
3	Snow reflectance at 1310 nm	%
4	Snow specific surface area	m ² kg ⁻¹
5	Snow optical mean radius	mm

1.2 File Information

1.2.1 Format

The data files are provided in ASCII text (.txt) format.

1.2.2 Naming Convention

There are three data files in this data set:

```
HMA_Snowfield_IceCube_ICIMOD_BC_20180423_0300.txt
HMA_Snowfield_IceCube_YalaGlacierA_20180424_0300.txt
HMA_Snowfield_IceCube_YalaGlacierB_20180424_0530.txt
```

The files are named according to the following convention, which is described in Table 2:

```
HMA_Snowfield_IceCube_[site]_[yyyymmdd]_[hhmm].[ext]
```

Table 2. File Naming Convention

Variable	Description
HMA_Snowfield	Indicates the data set <i>High Mountain Asia Langtang Snow Properties</i>
IceCube	Name of the instrument used
site	Indicates one of three measurement sites: <ul style="list-style-type: none"> • ICIMOD, BC • YalaGlacierA • YalaGlacierB
yyyymmdd	Year, month, and day of data collection
hhmm	Hour and minute of data collection (UTC time)
.ext	Indicates file type: .txt = ASCII text data file

1.3 Spatial Information

1.3.1 Coverage

Spatial coverage includes several locations on the Yala Glacier in Nepal, as noted by the spatial extents in Table 3.

Table 3. Information about Measurement Sites

Measurement Site Name	Latitude	Longitude	Altitude	Number of profile measurements
ICIMOD BC	28.21502° N	85.60986° E	4905 m	2
Yala Glacier A	28.23464° N	85.60918° E	5105 m	8
Yala Glacier B	28.23467° N	85.60915° E	5101 m	8

1.3.2 Resolution

This data set consists of three individual measurement sites located within 2.2 km of each other on the Yala Glacier in Nepal (see Table 3).

1.3.3 Geolocation

Each data file contains profile measurements for a single site (see Table 3).

1.4 Temporal Information

1.4.1 Coverage

23 April 2018 (ICIMOD BC)

24 April 2018 (Yala Glacier A and Yala Glacier B)

1.4.2 Resolution

Each data file contains a one-time measurement on either 23 April or 24 April 2018.

2 DATA ACQUISITION AND PROCESSING

2.1 Background

Understanding the microstructure of snow is important for accurately modelling microwave emission and optical reflectance, and thus crucial for remote sensing applications. The specific surface area of snow is one of the parameters that is most often used to determine the chemical and climatic impact of the snow cover, and therefore the energy budget of snow-covered surfaces.

2.2 Acquisition and Processing

The acquisition and processing steps include pre- and post-calibration of the instrument in the field in addition to the in-situ measurements at the site locations. For more information on the acquisition and processing steps, see Gallet et al. (2009).

2.3 Quality, Errors, and Limitations

See Gallet et al. (2009).

2.4 Instrumentation

IceCube is an optical system used to measure the specific surface area of snow. For more information on IceCube, visit the [A2 Photonic Sensors product website](#).

3 SOFTWARE AND TOOLS

The data files can be opened by any software that reads ASCII text files.

4 RELATED DATA SETS

[High Mountain Asia Langtang Shortwave Downward Irradiance](#)

[High Mountain Asia Langtang Snow Bidirectional Reflectance Factor](#)

[High Mountain Asia Langtang Automatic Weather Station Measurements](#)

[High Mountain Asia at NSIDC | Data Sets](#)

5 RELATED WEBSITES

[High Mountain Asia at NSIDC | Overview](#)

[NASA High Mountain Asia Project](#)

[NASA Research Announcement: Understanding Changes in High Mountain Asia](#)

6 CONTACTS

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7 ACKNOWLEDGMENTS

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8 REFERENCES

Gallet, J.-C., Domine, F., Zender, C. S., & Picard, G. (2009). Measurement of the specific surface area of snow using infrared reflectance in an integrating sphere at 1310 and 1550 nm. *The Cryosphere*, 3(2), 167–182. <https://doi.org/10.5194/tc-3-167-2009>

9 DOCUMENT INFORMATION

9.1 Publication Date

16 January 2019

9.2 Date Last Updated

18 March 2020