A Big Earth Data Platform for Three Poles

**Passive microwave SSM/I brightness temperature dataset for China (1987-2007)**

1、Description

This data set includes the microwave brightness temperatures obtained by the spaceborne microwave radiometer SSM/I carried by the US Defense Meteorological Satellite Program (DMSP) satellite. It contains the twice daily (ascending and descending) brightness temperatures of seven channels, which are 19H, 19V, 22V, 37H, 37V, 85H, and 85V.
The Specialized Microwave Imager (SSM/I) was developed by the Hughes Corporation of the United States. In 1987, it was first carried into the space on the Block 5D-/F8 satellite of the US Defense Meteorological Satellite Program (DMSP) to perform a detection mission. In the 10 years from when the DMSP soared to orbit in 1987 to when the TRMM soared to orbit in 1997, the SSM/I was the world's most advanced spaceborne passive microwave remote sensing detection instrument, having the highest spatial resolution in the world. The DMSP satellite is in a near-polar circular solar synchronous orbit; the elevation is approximately 833 km, the inclination is 98.8 degrees, and the orbital period is 102.2 minutes. It passes through the equator at approximately 6:00 local time and covers the whole world once every 24 hours. The SSM/I consists of seven channels set at four frequencies, and the center frequencies are 19.35, 22.24, 37.05, and 85.50 GHz. The instrument actually comprises seven independent, total-power, balanced-mixing, superheterodyne passive microwave radiometer systems, and it can simultaneously measure microwave radiation from Earth and the atmospheric systems. Except for the 22.24 GHz frequency, all the frequencies have both horizontal and vertical polarization states.
Some Eigenvalues of SSM/I
Channel Frequency
(GHz) Polarization Mode (V/H) Spatial Resolution
(km \* km) Footprint Size
(km)
19V 19.35 V 25×25 56
19H 19.35 H 25×25 56
22V 22.24 V 25×25 45
37V 37.05 V 25×25 33
37H 37.05 H 25×25 33
85V 85.50 V 12.5×12.5 14
85H 85.50 H 12.5×12.5 14
1. File Format and Naming:
Each group of data consists of remote sensing data files, .JPG image files and .met auxiliary information files as well as .TIM time information files and the corresponding .met time information auxiliary files.
The data file names and naming rules for each group in the SSMI\_Grid\_China directory are as follows:
China-EASE-Fnn-ML/HaaaabbbA/D.ccH/V (remote sensing data);
China-EASE-Fnn -ML/HaaaabbbA/D.ccH/V.jpg (image file);
China-EASE-Fnn-ML/HaaaabbbA/D.ccH/V.met (auxiliary information document);
China-EASE-Fnn-ML/HaaaabbbA/D.TIM (time information file); and
China-EASE- Fnn -ML/HaaaabbbA/D.TIM.met (time information auxiliary file).
Among them, EASE stands for EASE-Grid projection mode; Fnn represents carrier satellite number (F08, F11, and F13); ML/H represents multichannel low resolution and multichannel high resolution; A/D stands for ascending (A) and descending (D); aaaa represents the year; bbb represents the Julian day of the year; cc represents the channel number (19H, 19V, 22V, 37H, 37V, 85H, and 85V); and H/V represents horizontal polarization (H) and vertical polarization (V).
2. Coordinate System and Projection:
The projection method is an equal-area secant cylindrical projection, and the double standard latitude is 30 degrees north and south. For more information on EASE-GRID, please refer to http://www.ncgia.ucsb.edu/globalgrids-book/ease\_grid/. If you need to convert the EASE-Grid projection method into a geographic projection method, please refer to the ease2geo.prj file, which reads as follows.
Input
Projection cylindrical
Units meters
Parameters 6371228 6371228
1 /\* Enter projection type (1, 2, or 3)
0 00 00 /\* Longitude of central meridian
30 00 00 /\* Latitude of standard parallel
Output
Projection GEOGRAPHIC
Spheroid KRASovsky
Units dd
Parameters
End
3. Data Format:
Stored as binary integers, Row number: 308 \*166,each datum occupies 2 bytes. The data that are actually stored in this data set are the brightness temperatures \*10, and after reading the data, they need to be divided by 10 to obtain true brightness temperature.
4. Data Resolution:
Spatial resolution: 25 km, 12.5 km (SSM/I 85 GHz);
Time resolution: day by day, from 1978 to 2007.
5. The Spatial Coverage:
Longitude: 60°-140° east longitude;
Latitude: 15°-55° north latitude.
6. Data Reading:
Each group of data includes remote sensing image data files, .JPG image files and .met auxiliary information files. The JPG files can be opened with Windows image and fax viewers. The .met auxiliary information files can be opened with notepad, and the remote sensing image data files can be opened in ENVI and ERDAS software.

2、Keywords

Theme：Microwave remote sensing,Surface Freeze-thaw Cycle/state Remote Sensing
Discipline：Cryosphere
Places：China
Time：

3、Data details

1.Scale：None

2.Projection：EASE-Grid Global Cylindrical Equal Area

3.Filesize：27101.19MB

4.Data format：删格

4、Space scope

|  |  |  |
| --- | --- | --- |
| - | north：53.9 | - |
| west：73.2 | - | east：135.5 |
| - | south：17.8 | - |

5、Time frame:1987-01-08 08:00:00+00:00--2008-01-07 08:00:00+00:00

6、Reference method

References to data:

National Snow and Ice Data Center（NSIDC）. Passive microwave SSM/I brightness temperature dataset for China (1987-2007). A Big Earth Data Platform for Three Poles, 2011

References to articles:

Comiso, J. C. (2017). Bootstrap Sea Ice Concentrations from Nimbus-7 SMMR and DMSP SSM/I-SSMIS, Version 3. [Indicate subset used]. Boulder, Colorado USA. NASA National Snow and Ice Data Center Distributed Active Archive Center.

7、Supporting project information

8、Data resource provider

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