A Big Earth Data Platform for Three Poles

**Global Daily Total Preipitable Water dataset in all weather condition based on AMSR-E and AMSR2 (2002-2017)**

1、Description

Atmospheric water vapor is an important parameter for studying the water cycle. In the context of global warming, in order to better study the impact of atmospheric water vapor on the water cycle, a global daily scale AMSR-E/AMSR2 all-weather atmospheric precipitable water (TPW) dataset with a spatial resolution of 0.25 ° was constructed. In the data set, the TPW over land is mainly obtained by our newly developed 18.7 and 23.8 GHz brightness temperature data inversion algorithm based on AMSR-E and AMSR2; The ocean sky TPW data integrates AMSR-E/AMSR2 official TPW products. As a post-processing, in order to eliminate the systematic deviation between AMSR-E TPW and AMSR2 TPW, using AIRX2RET TPW as the benchmark, the histogram matching method was used to correct the systematic deviation of AMSR-E and AMSR2 TPW data on a global scale, to ensure the continuity of the data, and finally the global daily scale AMSR-E and AMSR2 TPW all-weather data sets were obtained. Among them, the time range of AMSR-E data is from July 8, 2002 to September 27, 2011, and the time range of AMSR-2 data is from January 1, 2013 to August 31, 2017. Each date contains two files: orbit raising and orbit lowering. The data format is Geotiff. The number of data layers is 2. The first layer is TPW data, with the unit of mm. The second layer is time information, which represents the number of seconds elapsed between the pixel observation time with UTC as the time base and 0:00:00 of the current day. The data set has reliable quality. Through verification and analysis with the global SuomiNET GPS TPW, the root mean square error of the data set is 3.5-5.2mm. As atmospheric precipitable water is an important geophysical parameter affecting surface remote sensing and also has an important impact on the earth's climate change, this data can be used for research on the impact of atmospheric water vapor on the water cycle, the assessment of atmospheric water resources and atmospheric correction in the context of climate warming.

2、Keywords

Theme：Atmospheric remote sensing products,Water vapor tendency,Water vapor,Remote Sensing Product,Microwave Remote Sensing,Precipitable water vapor,Remote Sensing Technology,Precipitable water,microwave,Atmosphere Remote Sensing,Total precipitable water,Atmospheric Water Vapor
Discipline：Atmosphere,Remote Sensing Technology
Places：global
Time：2013.01.01-2017.08.31, Daily, 2002.07.08-2011.09.27

3、Data details

1.Scale：None

2.Projection：WGS84

3.Filesize：52239.0MB

4.Data format：None

4、Space scope

|  |  |  |
| --- | --- | --- |
| - | north：90.0 | - |
| west：-180.0 | - | east：180.0 |
| - | south：-90.0 | - |

5、Time frame:2002-07-07 16:00:00+00:00--2017-08-30 16:00:00+00:00

6、Reference method

References to data:

ZHANG Hongxing , HUSI Letu, JI Dabin, SHI Jiancheng, SHANG Huazhe , LI Wei . Global Daily Total Preipitable Water dataset in all weather condition based on AMSR-E and AMSR2 (2002-2017). A Big Earth Data Platform for Three Poles, doi:10.11888/Atmos.tpdc.2728322022

References to articles:

Ji, D., Shi, J., Xiong, C., Wang, T., & Zhang, Y. (2017). A total precipitable water retrieval method over land using the combination of passive microwave and optical remote sensing. Remote Sens. Environ., vol. 191, pp. 313–327.

Ji, D., Shi, J., Letu, H., Li, W., Zhang, H., & Shang, H. (2021). A Total Precipitable Water Product and Its Trend Analysis in Recent Years Based on Passive Microwave Radiometers. IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing, vol. 14, pp. 7324-7335, doi: 10.1109/JSTARS.2021.3096535.

7、Supporting project information

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8、Data resource provider

name: JI Dabin
unit:
email: jidb@aircas.ac.cn

name: SHI Jiancheng
unit:
email: shijiancheng@nssc.ac.cn

name: HUSI Letu
unit:
email: husiletu@radi.ac.cn

name: LI Wei
unit: Innovation Academy for Precision Measurement Science and Technology, Chinese Academy of Sciences,
email: liwei@whigg.ac.cn

name: ZHANG Hongxing
unit: Innovation Academy for Precision Measurement Science and Technology, Chinese Academy of Sciences
email: caszhx@whigg.ac.cn

name: SHANG Huazhe
unit: the State Key Laboratory of Remote Sensing Science, Aerospace Information Research Institute, Chinese Academy of Sciences
email: shanghz@radi.ac.cn