A Big Earth Data Platform for Three Poles

**High spatial and temporal resolution dataset of surface solar radiation over China (2007-2014)**

1、Description

This is China's high temporal and spatial resolution surface solar radiation data set from 2007-2014. The time resolution is hourly, and the spatial resolution is 5 km. Each hour corresponds to a file named RAD\_yyyymmddhh.dat, where yyyy represents the year, mm represents the month, dd represents the day, and hh represents the hour (world time). Longitude (X-axis) grid: 70.025:0.05:140.025, latitude (Y-axis) grid: 59.975:-0.05:14.975. The file is a binary file, in the format of float (real\*4), with no header file.  
There are three steps to acquire this data set: (1) integrating polar-orbiting satellite MODIS and Japanese geostationary meteorological satellite MTSAT data and developing a cloud detection algorithm suitable for MTSAT and an estimation method for MTSAT cloud attribute information (effective particle radius and path water content); (2) developing a broad-band radiation model with cloud attribute, aerosol, water vapor, ozone and other inputs to form an efficient and rapid surface solar radiation inversion technique; and (3) inputting the acquired high-resolution cloud parameter information and other elements such as aerosol, water vapor, and ozone into the broad band radiation transmission model, finally obtaining the high temporal and spatial resolution surface solar radiation data set of China.  
It has been verified that the instantaneous root mean square error (RMSE) is generally less than 100 W•m-2, and the daily mean root mean square error (RMSE) is generally less than 35 W•m-2.

2、Keywords

Theme：Atmospheric remote sensing products,Radiation,Solar radiation,Atmosphere Remote Sensing  
Discipline：Atmosphere  
Places：China  
Time：2007-2014

3、Data details

1.Scale：None

2.Projection：

3.Filesize：285000.0MB

4.Data format：\*.dat

4、Space scope

|  |  |  |
| --- | --- | --- |
| - | north：59.975 | - |
| west：70.025 | - | east：140.025 |
| - | south：14.975 | - |

5、Time frame:2007-01-31 00:00:00+00:00--2015-01-30 00:00:00+00:00

6、Reference method

References to data:

TANG Wenjun. High spatial and temporal resolution dataset of surface solar radiation over China (2007-2014). A Big Earth Data Platform for Three Poles, doi:10.11888/AtmosphericPhysics.tpe.249449.file2018

References to articles:

Tang,W.J., Qin, J.,Yang, K., Liu, S.M., Lu, N., & Niu,X.L. (2016) . Retrieving high-resolution surface solar radiation with cloud parameters derived by combining MODIS and MTSAT data. Atmospheric Chemistry and Physics, 16(4), 2543-2557.

7、Supporting project information

8、Data resource provider

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