A Big Earth Data Platform for Three Poles

**Fused global land surface longwave downward radiation dataset (2016-2020, 1h/0.25°)**

1、Description

As a key component of the earth's energy balance system, surface longwave downward radiation (LWDR) is of great significance to the study of ecology and climate change. With the continuous improvement of remote sensing estimation accuracy and spatial-temporal resolution and accuracy of reanalysis data, remote sensing and reanalysis data fusion will be a new way to further improve the reliability and spatial-temporal continuity of key parameters such as surface radiation. Considering the difference in spatial-temporal resolution and local regional accuracy of current multi-source LWDR data, the study combines the measured data of stations around the world, spatio-temporal fusion of remote sensing observation data (CERES) with reanalysis data ERA5 and GLDAS, and develops a high-precision surface longwave downward radiation dataset covering the world from 2000 to 2020 with a spatial-temporal resolution of 1h/0.25 °. The correlation coefficient (R), mean deviation error (bias) and root mean square error (RMSE) of the newly developed dataset and the site measured data verified on the land surface are 0.97, -0.95 Wm-2 and 22.38 Wm-2, respectively; On the ocean surface, it is 0.99, -0.88 Wm-2 and 10.96 Wm-2, respectively. In particular, compared with the existing data, the new dataset shows better accuracy and stability in the middle and low latitudes and complex terrain areas.

2、Keywords

Theme：Radiation,Land Surface Parameter,Longwave radiation  
Discipline：Atmosphere,Terrestrial Surface  
Places：Global  
Time：2000-2020

3、Data details

1.Scale：None

2.Projection：

3.Filesize：364544.0MB

4.Data format：None

4、Space scope

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

5、Time frame:1999-12-31 16:00:00+00:00--2020-12-30 16:00:00+00:00

6、Reference method

References to data:

WANG Tianxing, WANG Shiyao . Fused global land surface longwave downward radiation dataset (2016-2020, 1h/0.25°). A Big Earth Data Platform for Three Poles, doi:10.11888/Atmos.tpdc.2727002022

References to articles:

Wang, S., Wang, T., Leng, W., Wang, G., & Letu, H. (2022). Toward an Improved Global Longwave Downward Radiation Product by Fusing Satellite and Reanalysis Data. IEEE Transactions on Geoscience and Remote Sensing, 60, 1-16, Art no. 4108416, doi: 10.1109/TGRS.2022.3179017.

7、Supporting project information

National Key R&D Program of China  
The Innovation Group Project of Southern Marine Science and Engineering Guangdong Laboratory (Zhuhai)  
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8、Data resource provider

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