A Big Earth Data Platform for Three Poles

**0.02° seamless hourly land surface temperature dataset over East Asia (2016-2021)**

1、Description

Hourly spatially complete land surface temperature (LST) products have a wide range of applications in many fields such as freeze-thaw state monitoring and summer high temperature heat wave monitoring. Although the LST retrieved from thermal infrared (TIR) remote sensing observations has high accuracy, it is spatially incomplete due to the influence of cloud, which heavily limits the application of LST. LST simulated by land surface models (LSM) is with high temporal resolution and spatiotemporal continuity, while the spatial resolution is relatively coarse and the accuracy is poor. Therefore, fusing the remote sensing retrieved LST and the model simulated LST is an effective way to obtain seamless hourly LST. The authors proposed a fusion method to generate 0.02° hourly seamless LST over East Asia and produced the corresponding data set.
This dataset is the 0.02 ° hourly seamless LST dataset over East Asia (2016-2021). Firstly, the iTES algorithm is employed to retrieve the Himawari-8/AHI LST. Secondly, the CLDAS LST is corrected to eliminate its system deviation. Finally, the multi-scale Kalman filter is employed to fuse Himawari-8/AHI LST and the bias-corrected CLDAS LST to generate 0.02 ° hourly seamless LST. The in situ verification results show that the root mean square error (RMSE) of the seamless LST is about 3k.
The temporal resolution and spatial resolution of this dataset are 1 hour and 0.02°, respectively. The time period is 2016-2021 over (0-60°N, 80°E-140°E).

2、Keywords

Theme：Cryosphere remote sensing products,Surface Freeze-thaw Cycle/state Remote Sensing
Discipline：Remote Sensing Technology,Cryosphere
Places：East Asia
Time：2016-2021, Hourly

3、Data details

1.Scale：None

2.Projection：

3.Filesize：585728.0MB

4.Data format：None

4、Space scope

|  |  |  |
| --- | --- | --- |
| - | north：60.0 | - |
| west：140.0 | - | east：80.0 |
| - | south：0.0 | - |

5、Time frame:2015-12-31 16:00:00+00:00--2021-12-31 15:00:00+00:00

6、Reference method

References to data:

CHENG Jie, DONG Shengyue, SHI Jiancheng. 0.02° seamless hourly land surface temperature dataset over East Asia (2016-2021). A Big Earth Data Platform for Three Poles, doi:10.11888/Cryos.tpdc.2725112022

References to articles:

Zhou, S., & Cheng, J. (2020). An Improved Temperature and Emissivity Separation Algorithm for the Advanced Himawari Imager. IEEE Transactions on Geoscience and Remote Sensing, 58(10), 7105-7124.

7、Supporting project information

Second Tibetan Plateau Scientific Expedition Program

8、Data resource provider

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