A Big Earth Data Platform for Three Poles

**1km seamless land surface temperature dataset of China (2002-2020)**

1、Description

Kilometer-level spatially complete (seamless) land surface temperature products have a wide range of applications needs in climate change and other fields. Satellite retrieved LST has high reliability. Integrating the LST retrieved from thermal infrared and microwave remote sensing observation is an effective way to obtain the SLT with certain accuracy and spatial integrity. Based on this guiding ideology, the author developed a framework for retrieving 1km and seamless LST over China landmass, and generated the LST data set accordingly (2002-2020)  
  
Firstly, a look-up table based empirical retrieval algorithm is developed for retrieving microwave LST from AMSR-E/AMSR2 observations. Then, AMSR-E/AMSR2 LST is downscaled by using geographic weighted regression to obtain 1km LST. Finally, the multi-scale Kalman filter is used to fuse AMSR-E/AMSR2 LST and MODIS LST to generate a 1km seamless LST data set.  
  
The ground valuation results show that the root mean square error (RMSE) of the 1km seamless LST is about 3K. In addition, the spatial distribution of the 1km seamless LST is consistent with MODIS LST and CLDAS LST.

2、Keywords

Theme：Cryosphere remote sensing products,Surface Freeze-thaw Cycle/state Remote Sensing  
Discipline：Cryosphere  
Places：China  
Time：Daily, 2002-2020

3、Data details

1.Scale：None

2.Projection：

3.Filesize：5359097.0MB

4.Data format：None

4、Space scope

|  |  |  |
| --- | --- | --- |
| - | north：53.47 | - |
| west：73.55 | - | east：134.99 |
| - | south：18.33 | - |

5、Time frame:2002-07-03 16:00:00+00:00--2020-12-31 03:59:59+00:00

6、Reference method

References to data:

CHENG Jie, DONG Shengyue, SHI Jiancheng. 1km seamless land surface temperature dataset of China (2002-2020). A Big Earth Data Platform for Three Poles, doi:10.11888/Meteoro.tpdc.2716572021

References to articles:

Zhang, Q., & Cheng, J. (2020). An Empirical Algorithm for Retrieving Land Surface Temperature From AMSR-E Data Considering the Comprehensive Effects of Environmental Variables. Earth and Space Science, 7, e2019EA001006. https://doi.org/10.1029/2019EA001006  
  
Xu, S., & Cheng, J. (2021). A new land surface temperature fusion strategy based on cumulative distribution function matching and multiresolution Kalman filtering. Remote Sensing of Environment, 254, 112256  
  
Zhang, Q., Wang, N., Cheng, J., & Xu, S. (2020). A Stepwise Downscaling Method for Generating High-Resolution Land Surface Temperature From AMSR-E Data. IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing, 13, 5669-5681

7、Supporting project information

Second Tibetan Plateau Scientific Expedition Program  
2nd survey of Tibet plateau

8、Data resource provider

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