A Big Earth Data Platform for Three Poles

**25 km resolution snow depth on Arctic sea ice dataset (2012-2020)**

1、Description

As an important parameter of snowpack, the snow depth can adjust changes in sea ice and plays a vital role in the climate system. This dataset provides the daily snow depth on Arctic sea ice during cold-season from 2012 to 2020 (October-April). The snow depth retrieval algorithm combines linear regression and deep learning algorithm (LSTM). Firstly, according to AMSR2 brightness temperature data and the buoy snow depth data, the optimal gradient ratio for estimating the snow depth on first-year ice (FYI) is determined, and the snow depth retrieval model on FYI is established. The input of LSTM is different gradient rates, polarization ratio (PR) of the brightness temperature at 37 GHz, and the output is snow depth on sea ice. Then, the snow depth retrieval model on multi-year ice (MYI) is determined. Finally, the snow depth on Arctic sea ice with a 25-km spatial resolution is obtained. This dataset performs well in reflecting snow depths over thick and thin sea ice, which agrees well with the NASA Operation IceBridge (OIB) data, with the root mean square error of 7.35 cm. Hence, this dataset provides accurate snow depth estimates for retrieving sea ice thickness and is conducive to analyses of Arctic mass balance and energy balance.

2、Keywords

Theme：Snow on sea ice,Sea Ice  
Discipline：Cryosphere  
Places：Arctic  
Time：cold season

3、Data details

1.Scale：None

2.Projection：North\_Pole\_Stereographic

3.Filesize：979.5MB

4.Data format：None

4、Space scope

|  |  |  |
| --- | --- | --- |
| - | north：90.0 | - |
| west：-180.0 | - | east：180.0 |
| - | south：30.98 | - |

5、Time frame:2012-09-30 16:00:00+00:00--2020-04-29 16:00:00+00:00

6、Reference method

References to data:

LI Haili, KE Changqing. 25 km resolution snow depth on Arctic sea ice dataset (2012-2020). A Big Earth Data Platform for Three Poles, doi:10.11888/Snow.tpdc.2716392021

References to articles:

7、Supporting project information

8、Data resource provider

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