A Big Earth Data Platform for Three Poles

**An elevation change dataset in typical drainages of Antarctica ice sheet (2010-2020)**

1、Description

Pine Island Glacier, Swett Glacier, etc. are distributed in the basins of the Antarctic Ice Sheet 21 and 22, which is one of the areas with the most severe melting in the Southwest Antarctica. This dataset first uses Cryosat-2 data (August 2010 to October 2018) to establish a plane equation in each regular grid, taking into account terrain items, seasonal fluctuations, backscattering coefficients, wave front width, lifting rails and other factors, and calculates the elevation change of ice cover surface in the grid through least square regression. In addition, we used ICESat-2 data (October 2018 to December 2020) to calculate the surface elevation change during the two periods by obtaining the elevation difference at the intersection of satellite lifting orbits in each regular grid. The spatial resolution of surface elevation change data in two periods is 5km × 5km, the file format is GeoTIFF, the projection coordinate is polar stereo projection (EPSG 3031), and it is named by the name of the satellite altimetry data used. The data can be opened using ArcMap, QGIS and other software. The results show that the average elevation change rate of the region from 2010 to 2018 is -0.34 ± 0.08m/yr, which belongs to the area with severe melting. The annual average elevation change rate from October 2018 to November 2020 is -0.38 ± 0.06m/yr, which is in an intensified state compared with CryoSat-2 calculation results.

2、Keywords

Theme：ICESat-2,Antarctic,CryoSat-2,Remote Sensing Product,Satellite Altimetry,plane fit,crossover analysis,Remote Sensing Technology,Glacier(Ice Sheet),Elevation change
Discipline：Remote Sensing Technology,Cryosphere
Places：21 and 22 drainage of Antarctica ice sheet
Time：2010-2020

3、Data details

1.Scale：None

2.Projection：South\_Pole\_Stereographic

3.Filesize：0.5MB

4.Data format：None

4、Space scope

|  |  |  |
| --- | --- | --- |
| - | north：-80.0 | - |
| west：-90.0 | - | east：-100.0 |
| - | south：-70.0 | - |

5、Time frame:2010-07-31 16:00:00+00:00--2020-12-30 16:00:00+00:00

6、Reference method

References to data:

LIANG Shuang , YANG Bojin , HUANG Huabing , LI Xinwu . An elevation change dataset in typical drainages of Antarctica ice sheet (2010-2020). A Big Earth Data Platform for Three Poles, doi:10.11888/Cryos.tpdc.2728712022

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Krishfield, R., Kurtz, N., Farrell, S., & Davidson, M. (2013). CryoSat-2 estimates of Arctic sea ice thickness and volume, Geophysical Research Letters, 40, doi:10.1002/grl.50193.

7、Supporting project information

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