A Big Earth Data Platform for Three Poles

**Global Cryosat-2 GDR dataset (version 1.0) (2010-2016)**

1、Description

The global Cryosat-2 GDR dataset is generated by the European Space Agency (ESA); it has a temporal coverage from 2010 to 2016 and covers the globe.
On April 8, 2010, the ESA launched the Cryosat-2 high-tilt polar orbit satellite. The satellite is equipped with an SAR Interferometer Radar Altimeter (SIRAL), which is mainly used to monitor polar ice thickness and sea ice thickness changes, and, furthermore, to study the effects of melting polar ice on global sea level rise and that of global climate change on Antarctic ice thickness. The altimeter operates in the Ku-band and at a frequency of 13.575 GHz, it includes three measurement modes. One is a low-resolution altimeter measurement mode (LRM) that points to the subsatellite point to obtain all surface observations for land, sea, and ice sheets; its processing is similar to ENVISAT/RA-2, with an orbital resolution of 5 to 7 km. The second is the Synthetic Aperture Radar (SAR) measurement mode, which is mainly used to improve the accuracy and resolution of sea ice observations; it can make the resolution along the orbit reach approximately 250 m. The third is the Interferometric Synthetic Aperture Radar (InSAR), which is mainly used to improve the accuracy of areas with complex terrain such as the edges of ice sheets or ice shelves.
The CryoSat -2/SIRAL data products mainly include 0-level data, 1b-level data, 2-level data and high-level data. The Cryosat-2/SIRAL products consist of two files: an XML head file (.HDR) and a data product file (.DBL). The HDR file is an auxiliary ASCII file for fast identification and retrieval of the data files. 1b-level products are stored separately according to the measurement modes, and the data recording formats of different modes are also different. Each waveform in LRM mode and SAR mode has 128 sampling points, while that in SARIn mode has 512 sampling points. 2-level GDR products are available for most scientific applications, including measurement time, geographic location, altitude, and more. In addition, the altitude information in GDR products has been obtained through instrumental calibration, transmission delay corrections, geometric corrections, and geophysical corrections (such as atmospheric corrections and tidal corrections). The GDR products are single global full-track data, that is, the measurement results of the three modes. After different processing, they are combined in chronological order; thereby, the data recording formats are unified. The data in the three modes use different waveform retracking algorithms to obtain altitude values. In the latest updated Baseline C data, the LRM mode data use three algorithms: Refined CFI, UCL and Refined OCOG.

2、Keywords

Theme：Cryosphere remote sensing products,Surface Freeze-thaw Cycle/state Remote Sensing
Discipline：Cryosphere
Places：globe
Time：2010-2016

3、Data details

1.Scale：None

2.Projection：

3.Filesize：341.0MB

4.Data format：HDR;DBL

4、Space scope

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

5、Time frame:2010-01-18 16:00:00+00:00--2017-01-17 16:00:00+00:00

6、Reference method

References to data:

FU Wenxue. Global Cryosat-2 GDR dataset (version 1.0) (2010-2016). A Big Earth Data Platform for Three Poles, doi:10.11888/Geophys.tpe.0000080.file2018

References to articles:

7、Supporting project information

CASEarth:Big Earth Data for Three Poles（grant No. XDA19070000）

8、Data resource provider

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