A Big Earth Data Platform for Three Poles

**Multiyear in-situ L-band microwave radiometry of land surface processes on the Tibetan Plateau (2016-2019)**

1、Description

This dataset contains measurements of L-band brightness temperature by an ELBARA-III microwave radiometer in horizontal and vertical polarization, profile soil moisture and soil temperature, turbulent heat fluxes, and meteorological data from the beginning of 2016 till August 2019, while the experiment is still continuing. Auxiliary vegetation and soil texture information collected in dedicated campaigns are also reported. This dataset can be used to validate the Soil Moisture and Ocean Salinity (SMOS) and Soil Moisture Active Passive (SMAP) satellite based observations and retrievals, verify radiative transfer model assumptions and validate land surface model and reanalysis outputs, retrieve soil properties, as well as to quantify land-atmosphere exchanges of energy, water and carbon and help to reduce discrepancies and uncertainties in current Earth System Models (ESM) parameterizations.

ELBARA-III horizontal and vertical brightness temperature are computed from measured radiometer voltages and calibrated internal noise temperatures. The data is reliable, and its quality is evaluated by 1) Perform ‘histogram test’ on the voltage samples (raw-data) of the detector output at sampling frequency of 800 Hz. Statistics of the histogram test showed no non-Gaussian Radio Frequency Interference (RFI) were found when ELBAR-III was operated. 2) Check the voltages at the antenna ports measured during sky measurements. Results showed close values. 3) Check the instrument internal temperature, active cold source temperature and ambient temperature. 3) Analysis the angular behaviour of the processed brightness temperatures.

-Temporal resolution: 30 minutes
-Spatial resolution: incident angle of observation ranges from 40° to 70° in step of 5°. The area of footprint ranges between 3.31 m^2 and 43.64 m^2
-Accuracy of Measurement: Brightness temperature, 1 K; Soil moisture, 0.001 m^3 m^-3; Soil temperature, 0.1 °C
-Unit: Brightness temperature, K; Soil moisture, m^3 m^-3; Soil temperature, °C/K

2、Keywords

Theme：soil moisture,Remote Sensing Technology,Freeze thawing,Hydrology,Microwave radiometer,Frozen Ground
Discipline：Terrestrial Surface,Remote Sensing Technology,Cryosphere
Places：Tibetan Plateau, Maqu
Time：2016-2019

3、Data details

1.Scale：None

2.Projection：

3.Filesize：31.51MB

4.Data format：None

4、Space scope

|  |  |  |
| --- | --- | --- |
| - | north：34.25 | - |
| west：101.63 | - | east：102.75 |
| - | south：33.5 | - |

5、Time frame:2016-01-20 16:00:00+00:00--2019-09-16 16:30:00+00:00

6、Reference method

References to data:

WEN Jun, BOB Su. Multiyear in-situ L-band microwave radiometry of land surface processes on the Tibetan Plateau (2016-2019). A Big Earth Data Platform for Three Poles, doi:10.6084/m9.figshare.12058038.v12020

References to articles:

Su, Z., Wen, J., Zeng, Y. et al. (2020). Multiyear in-situ L-band microwave radiometry of land surface processes on the Tibetan Plateau. Sci Data 7, 317. https://doi.org/10.1038/s41597-020-00657-1

7、Supporting project information

ESA ELBARA-II/III Loan Agreement EOP-SM/2895/TC-tc
ESA MOST Dragon IV Program (Monitoring Water and Energy Cycles at Climate Scale in the Third Pole Environment)
Netherlands Organization for Scientific Research under Project ALW-GO/14-29

8、Data resource provider

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