A Big Earth Data Platform for Three Poles

**HiWATER: Dataset of ground truth measurements synchronizing with airborne PLMR mission in the Yingke oasis and Huazhaizi desert steppe on July 10, 2012**

1、Description

On July 10, 2012, the airborne flight and ground observation was synchronously carried out in the PLMR quadrat of Yingke Oasis and the Huazhaizi Desert. PLMR (Polarimetric L-band Multibeam Radiometer) is a dual-polarized (H/V) L-band microwave radiometer with a center frequency of 1.413 GHz, a bandwidth of 24 MHz, and a resolution of 1 km (relative flight height of 3 km).The radiometer has 6 beams to observe synchronously, and the incident angles are ±7º，±21.5º，±38.5º, and the sensitivity is less than 1K. The flight observation mainly covers the artificial oasis eco-hydrological test area in the middle reaches. This ground-synchronized data set provides a basic ground dataset for developing and validating passive microwave remote sensing inversion soil moisture algorithms.  
Quadrat and sampling strategy:  
The observation area is located in the transition zone between the southern margin of Zhangye Oasis and Anyang beach desert, the west side of Zhang (Zhangye)-Da (Daman) highway. It is divided into two parts by the main canal of the Dragon Canal from North to South. The Southwest area is a desert quadrat with the size of 1 km×1 km. The desert is relatively homogeneous, so soil moisture of 5 points in the 1 km quadrat are collected (1 point of each corner and the center point, in the actual measurement process, several extra points can be measured along the road). The four corner points are 600 meters away from each other,except the diagonal direction. And the southwest corner point is Huazhaizi Desert Station, for the convenience of comparison with weather station data. On the northeast side, a large size quadrat of 6 km×1.6 km is selected for simultaneous observation of the oasis underlying surface.In order to obtain the brightness temperature comparison with the PLMR observation, the quadrat was chose based on the following factors :surface coverage representative, avoiding the residential and greenhouses, crossing the oasis farmland and part of the Southern desert, accessibility, and observation time(road consumption).  
Taking the resolution of PLMR observations into consideration, in the synchronous observation, 11 sampling lines (East-West distribution) were collected with an interval of 160 meters from the East to the West. Each line from the North to the South was separated by 21 points with an interval of 80 meters. And 4 Hydraprobe Data Acquisition System (HDAS, Reference 2) were used to measure simultaneously.  
Measurement contents:  
About 230 points of the quadrat were collected, 2 observations were performed on each point, that is, 2 observations were performed on each sampling point of the film mulched corn field, 1 inside the film (marked as a in the data record), 1 outside the film (marked as b in the data record). Since the HDAS system useed the POGO portable soil sensor, the soil temperature, soil moisture (volumetric water content), loss tangent, soil electrical conductivity, soil complex dielectric real part and imaginary part were obtained by observation. No special simultaneous sampling of vegetation was carried out on the same day.  
Data:  
The data set includes two parts: soil moisture observation and vegetation observation. The former saves the data as a vector file, the spatial position is the position of each sampling point (WGS84+UTM 47N), and the measurement information of soil moisture is recorded in the attribute file.

2、Keywords

Theme：Soil,Soil moisture/Water content  
Discipline：Terrestrial Surface  
Places：Heihe River Basin, the artificial oasis experimental area in the middle reaches  
Time：2012-07-10, 2012

3、Data details

1.Scale：None

2.Projection：4326

3.Filesize：1.0MB

4.Data format：文本

4、Space scope

|  |  |  |
| --- | --- | --- |
| - | north：38.782 | - |
| west：100.332 | - | east：100.35 |
| - | south：38.77 | - |

5、Time frame:2018-11-21 10:51:07+00:00--2018-11-21 10:51:07+00:00

6、Reference method

References to data:

LI Xin. HiWATER: Dataset of ground truth measurements synchronizing with airborne PLMR mission in the Yingke oasis and Huazhaizi desert steppe on July 10, 2012. A Big Earth Data Platform for Three Poles, doi:10.3972/hiwater.054.2013.db2017

References to articles:

Li, X., Liu, S.M., Xiao, Q., Ma, M.G., Jin, R., Che, T., Wang, W.Z., Hu, X.L., Xu, Z.W., Wen, J.G., Wang, L.X. (2017). A multiscale dataset for understanding complex eco-hydrological processes in a heterogeneous oasis system. Scientific Data, 4, 170083. doi:10.1038/sdata.2017.83.

7、Supporting project information

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8、Data resource provider

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