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 7, 2012**

1、Description

On July 7, 2012, airborne ground synchronous observation was carried out in plmr quadrats of Yingke oasis and 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, a resolution of 1 km (relative altitude of 3 km), six beam simultaneous observations, an incidence angle of ± 7 °, ± 21.5 °, ± 38.5 °, and a sensitivity of < 1K. The flight mainly covers the middle reaches of the artificial oasis eco hydrological experimental area. The local synchronous data set can provide the basic ground data set for the development and verification of passive microwave remote sensing soil moisture inversion algorithm.   
Quadrat and sampling strategy:   
The observation area is located in the transition zone between the southern edge of Zhangye Oasis and anyangtan desert, on the west side of Zhangye Daman highway, and across the trunk canal of Longqu in the north and the south, which is divided into two parts. In the southwest, there is a 1 km × 1 km desert quadrat. Because the desert is relatively homogeneous, here 1 The soil moisture of 5 points (1 point and center point around each side, and several more points can be measured during walking along the road in the actual measurement process) is collected in KM quadrat. The four corner points are 600 m apart from each other except the diagonal direction. The southwest corner point is huazhaizi desert station, which is convenient to compare with the data of meteorological station. On the northeast side, a large sample with an area of 1.6km × 1.6km was selected to carry out synchronous observation on the underlying surface of oasis. The selection of quadrat is mainly based on the consideration of the representativeness of surface coverage, avoiding residential buildings and greenhouses as much as possible, crossing oasis farmland and some deserts in the south, accessibility, and observation (road consumption) time, so as to obtain the comparison of brightness and temperature with plmr observation.   
Considering the resolution of plmr observation, 11 splines (east-west distribution) were collected at the interval of 160 m in the east-west direction. Each line has 21 points (north-south direction) at the interval of 80 M. four hydraprobe data acquisition systems (HDAS, reference 2) were used for simultaneous measurement. Measurement content:   
About 230 points on the quadrat were obtained, each point was observed twice, that is to say, two times were observed at each sampling point, one time was inside the film (marked as a in the data record) and one time was outside the film (marked as B in the data record). As the HDAS system uses pogo portable soil sensor, the soil temperature, soil moisture (volume moisture content), loss tangent, soil conductivity, real part and virtual part of soil complex dielectric are observed. Vegetation parameter observation was carried out in some representative soil water sampling points, and the measurement of plant height and biomass (vegetation water content) was completed.   
Data:   
This data set includes two parts: soil moisture observation and vegetation observation. The former saves the data format as a vector file, the spatial location is the location of each sampling point (WGS84 + UTM 47N), and the measurement information of soil moisture is recorded in the attribute file; the vegetation sampling information is recorded in the excel table.

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：2012-07-07, 2012

3、Data details

1.Scale：None

2.Projection：4326

3.Filesize：14.4MB

4.Data format：文本

4、Space scope

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

5、Time frame:2018-11-27 10:47:06+00:00--2018-11-27 10:47:06+00:00

6、Reference method

References to data:

MA Mingguo, LI Xin, WANG Shuguo. HiWATER: Dataset of ground truth measurements synchronizing with airborne PLMR mission in the Yingke oasis and Huazhaizi desert steppe on July 7, 2012. A Big Earth Data Platform for Three Poles, doi:10.3972/hiwater.053.2013.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

"Heihe Watershed Allied Telemetry Experimental Research (HiWATER)  
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8、Data resource provider

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