A Big Earth Data Platform for Three Poles

**HiWATER: Dataset of flux observation matrix (NO.1 large aperture scintillometer) of the MUlti-Scale Observation EXperiment on Evapotranspiration over heterogeneous land surfaces 2012 (MUSOEXE-12)**

1、Description

This dataset contains the flux measurements from the large aperture scintillometer (LAS) at site No.1 in the flux observation matrix. There were two types of LASs at site No.1: German BLS900 and China zzlas. The observation periods were from 7 June to 19 September, 2012, and 16 June to 19 September, 2012, for the BLS900 and the zzlas, respectively. The north tower is placed with the receiver of BLS900 and the transmitter of zzlas, and the south tower is placed with the transmitter of BLS900 and the receiver of zzlas. The site (north: 100.352° E, 38.884° N; south: 100.351° E, 38.855° N) was located in the Yingke irrigation district, which is near Zhangye, Gansu Province. The elevation is 1552.75 m. The underlying surface between the two towers contains corn, greenhouse, and village. The effective height of the LASs was 33.45 m; the path length was 3256 m. Data were sampled at 1 min intervals.
Raw data acquired at 1 min intervals were processed and quality-controlled. The data were subsequently averaged over 30 min periods. The main quality control steps were as follows. (1) The data were rejected when Cn2 was beyond the saturated criterion (Cn2>3.05E-14). (2) Data were rejected when the demodulation signal was small (BLS900: Average X Intensity<1000; zzlas: Demod<-40 mv). (3) Data were rejected within 1 h of precipitation. (4) Data were rejected at night when weak turbulence occurred (u\* was less than 0.1 m/s). The sensible heat flux was iteratively calculated by combining with meteorological data and based on Monin-Obukhov similarity theory.
There were several instructions for the released data. (1) The data were primarily obtained from BLS900 measurements; missing flux measurements from the BLS900 were filled with measurements from the zzlas. Missing data were denoted by -6999. (2) The dataset contained the following variables: data/time (yyyy-mm-dd hh:mm:ss), the structural parameter of the air refractive index (Cn2, m-2/3), and the sensible heat flux (H\_LAS, W/m^2). (3) In this dataset, the time of 0:30 corresponds to the average data for the period between 0:00 and 0:30; the data were stored in \*.xlsx format. Moreover, suspicious data were marked in red.
For more information, please refer to Liu et al. (2016) (for multi-scale observation experiment or sites information), Xu et al. (2013) (for data processing) in the Citation section.

2、Keywords

Theme：Heat flux,Radiation
Discipline：Atmosphere
Places：Heihe River Basin, the artificial oasis experimental area in the middle reaches, flux observation matrix
Time：2012-06-07 to 2012-09-19, 2012-06-16 to 2012-09-19, 2012

3、Data details

1.Scale：None

2.Projection：4326

3.Filesize：0.16MB

4.Data format：文本

4、Space scope

|  |  |  |
| --- | --- | --- |
| - | north：38.8547 | - |
| west：100.3524 | - | east：100.3524 |
| - | south：38.8547 | - |

5、Time frame:2012-06-22 23:26:00+00:00--2012-10-04 23:26:00+00:00

6、Reference method

References to data:

LI Xin, LIU Shaomin, XU Ziwei. HiWATER: Dataset of flux observation matrix (NO.1 large aperture scintillometer) of the MUlti-Scale Observation EXperiment on Evapotranspiration over heterogeneous land surfaces 2012 (MUSOEXE-12). A Big Earth Data Platform for Three Poles, doi:10.3972/hiwater.102.2013.db2016

References to articles:

Liu, S.M., Xu, Z.W., Song, L.S., Zhao, Q.Y., Ge, Y., Xu, T.R., Ma, Y.F., Zhu, Z.L., Jia, Z.Z., Zhang, F. (2016). Upscaling evapotranspiration measurements from multi-site to the satellite pixel scale over heterogeneous land surfaces. Agricultural and Forest Meteorology, 230-231, 97-113. doi:10.1016/j.agrformet.2016.04.008.

Xu, Z.W., Liu, S.M., Li, X., Shi, S.J., Wang, J.M., Zhu, Z.L., Xu, T.R., Wang, W.Z., & Ma, M.G. (2013). Intercomparison of surface energy flux measurement systems used during the HiWATER-MUSOEXE. Journal of Geophysical Research, 118, 13140-13157, doi:10.1002/2013JD020260.

7、Supporting project information

National Natural Science Foundation of China

8、Data resource provider

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