A Big Earth Data Platform for Three Poles

**HiWATER: Dataset of hydrometeorological observation network (large aperture scintillometer of Sidaoqiao Superstation, 2013)**

1、Description

This dataset contains the flux measurements from the large aperture scintillometer (LAS) at Sidaoqiao Superstation (two sites) in the hydrometeorological observation network of Heihe River Basin. There were two types of LASs at site 1: German BLS900 and Netherlands Kipp&zonen. The north tower was set up with the BLS900/Kipp&zonen receiver, and the south tower was equipped with the BLS900/Kipp&zonen transmitter. The observation period of BLS900\_1 and Kipp&zonen were from 11 July to 13 November, 2013, and 11 July to 12 September, 2013, respectively. There was one type of LAS at site 2: German BLS900. The north tower was set up with the BLS900 receiver, and the south tower was equipped with the BLS900 transmitter. BLS900\_2 has been in use since 16 September, 2013. The Sidaoqiao Superstation (site1, north: 101.147° E, 42.005° N, south: 101.131° E, 41.987° N; site 2, north: 101.137° E, 42.008° N, south: 101.121° E, 41.990° N) was located in Ejinaqi, Inner Mongolia. The underlying surfaces between the two towers were tamarisk, populus, bare land and farmland. The elevation is 873 m. The effective height of the LASs was 25.5 m, and the path length of site 1 and site 2 were 2390 m and 2380 m, respectively. The data were sampled at 5 Hz and 1 Hz intervals for BLS900 and zzlas, respectively, and then averaged over 1 min.
The raw data acquired at 1 min intervals were processed and quality controlled. The data were subsequently averaged over 30 min periods, in which sensible heat flux was iteratively calculated by combining Cn2 with meteorological data according to the Monin-Obukhov similarity theory. The main quality control steps were as follows: (1) The data were rejected when Cn2 exceeded the saturated criterion (BLS900\_1: Cn2>7.25E-14, Kipp&zonen: Cn2>7.84E-14, BLS900\_2: Cn2>7.33E-14). (2) The data were rejected when the demodulation signal was small (BLS900: Average X Intensity<1000; Kipp&zonen: Demod>-20mv). (3) The data were rejected when collected during precipitation. (4) The data were rejected if collected at night when weak turbulence occurred (u\* was less than 0.1 m/s). In the iteration process, the universal functions of Thiermann and Grassl, 1992 and Andreas, 1988 were selected for BLS900 and Kipp&zonen, respectively.
Several instructions were included with the released data. (1) The data of site 1 were primarily obtained from BLS900\_1 measurements, and missing flux measurements from the BLS900\_1 instrument were substituted with measurements from the Kipp&zonen instrument. The missing data were denoted by -6999. The data of site 2 were obtained from BLS900\_2 measurements, missing data were denoted by -6999. Due to the problems of BLS900\_1 transmitter, the data after 13 November, 2013, were not collected. (2) The dataset contained the following variables: data/time (yyyy-m-d h:mm), the structural parameter of the air refractive index (Cn2, m-2/3), and the sensible heat flux (H\_LAS, W/m^2). In this dataset, a time of 0:30 corresponds to the average data for the period between 0:00 and 0:30, and the data were stored in \*.xls format. Moreover, suspicious data were marked in red.
For more information, please refer to Li et al. (2013) (for hydrometeorological observation network or sites information), Liu et al. (2011) (for data processing) in the Citation section.

2、Keywords

Theme：Radiation,Sensible heat flux
Discipline：Atmosphere
Places：Heihe River Basin, Sidaoqiao superstation, the natural oasis eco-hydrology experimental area in the lower reaches
Time：2013-09-16 to 2013-12-31, 2013, 2013-07-11 to 2013-11-13

3、Data details

1.Scale：None

2.Projection：4326

3.Filesize：0.39MB

4.Data format：文本

4、Space scope

|  |  |  |
| --- | --- | --- |
| - | north：42.005 | - |
| west：101.147 | - | east：101.147 |
| - | south：42.005 | - |

5、Time frame:2013-07-19 08:00:00+00:00--2013-11-21 08:00:00+00:00

6、Reference method

References to data:

TAN Junlei, LI Xin, LIU Shaomin, XU Ziwei, CHE Tao, REN Zhiguo. HiWATER: Dataset of hydrometeorological observation network (large aperture scintillometer of Sidaoqiao Superstation, 2013). A Big Earth Data Platform for Three Poles, doi:10.3972/hiwater.208.2014.db2016

References to articles:

Liu, S.M., Xu, Z.W., Wang, W.Z., Bai, J., Jia, Z., Zhu, M., & Wang, J.M. (2011). A comparison of eddy-covariance and large aperture scintillometer measurements with respect to the energy balance closure problem. Hydrology and Earth System Sciences, 15(4), 1291-1306.

Liu, S.M., Li, X., Xu, Z.W., Che, T., Xiao, Q., Ma, M.G., Liu, Q.H., Jin, R., Guo, J.W., Wang, L.X., Wang, W.Z., Qi, Y., Li, H.Y., Xu, T.R., Ran, Y.H., Hu, X.L., Shi, S.J., Zhu, Z.L., Tan, J.L., Zhang, Y., & Ren, Z.G. (2018). The Heihe Integrated Observatory Network: A Basin-Scale Land Surface Processes Observatory in China. Vadose Zone Journal, 17(1), 180072. doi:10.2136/vzj2018.04.0072.

7、Supporting project information

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