A Big Earth Data Platform for Three Poles

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

1、Description

This dataset contains the flux measurements from the large aperture scintillometer (LAS) at A’rou Superstation in the hydrometeorological observation network of Heihe River Basin between 14 October, 2012, and 31 December, 2013. There were two types of LASs at A’rou Superstation: German BLS450 and China zzlas. The north tower was set up with the zzlas receiver and the BLS450 transmitter, and the south tower was equipped with the zzlas transmitter and the BLS450 receiver. Zzlas has been in use since 14 October, 2012, and the observation period of BLS450 was from 9 August to 10 December, 2013. The site (north: 100.467° E, 38.050° N; south: 100.450° E, 38.033° N) was located in Caodaban village of A’rou town in Qilian county, Qinghai Province. The underlying surface between the two towers was alpine meadow. The elevation is 3033 m. The effective height of the LASs was 9.5 m, and the path length was 2390 m. The data were sampled at 5 Hz and 1 Hz intervals for BLS450 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 (BLS450: Cn2>7.25E-14, zzlas: Cn2>7.84E-14). (2) The data were rejected when the demodulation signal was small (BLS450: Average X Intensity<1000; zzlas: Demod>-20 mv). (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 BLS450 and zzlas, respectively.  
Several instructions were included with the released data. (1) The data were primarily obtained from BLS450 measurements, and missing flux measurements from the BLS450 instrument were substituted with measurements from the zzlas instrument. The missing data were denoted by -6999. Due to the drift of the zzlas signal, data from 10 November to 23 November, 2012, and 14 March to 10 April, 2013, were excluded. Due to the LAS tower’s lean, the data from 10 April to 31 May, 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, A’rou Superstation, the cold region hydrology experimental area in the upper reaches  
Time：2012-10-14 to 2013-12-31, 2013

3、Data details

1.Scale：None

2.Projection：4326

3.Filesize：0.72MB

4.Data format：文本

4、Space scope

|  |  |  |
| --- | --- | --- |
| - | north：38.05 | - |
| west：100.467 | - | east：100.467 |
| - | south：38.05 | - |

5、Time frame:2012-11-08 08:00:00+00:00--2014-01-25 08:00:00+00:00

6、Reference method

References to data:

TAN Junlei, LI Xin, XU Ziwei, CHE Tao, ZHANG Yang. HiWATER: Dataset of hydrometeorological observation network (large aperture scintillometer of A’rou Superstation, 2013). A Big Earth Data Platform for Three Poles, doi:10.3972/hiwater.207.2014.db2018

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.  
  
Che, T., Li, X., Liu, S., Li, H., Xu, Z., Tan, J., Zhang, Y., Ren, Z., Xiao, L., Deng, J., Jin, R., Ma, M., Wang, J., & Yang, X. (2019). Integrated hydrometeorological, snow and frozen-ground observations in the alpine region of the Heihe River Basin, China. Earth System Science Data, 11, 1483-1499

7、Supporting project information

National Natural Science Foundation of China

8、Data resource provider

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