A Big Earth Data Platform for Three Poles

**Qilian mountains integrated observatory network: Dataset of Heihe integrated observatory network (large aperture scintillometer of A'rou superstation, 2018)**

1、Description

This dataset contains the flux measurements from the large aperture scintillometer (LAS) at Arou Superstation in the Heihe integrated observatory network from January 1 to December 31 in 2018. There were two types of LASs at Arou Superstation: BLS450 and zzlas, produced by Germany and China, respectively. 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. The site (north: 100.471° E, 38.057° N; south: 100.457° E, 38.038° 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 1 minute at both BLS450 and zzlas.  
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: Mininum X Intensity<50; zzlas: 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 BLS450 and zzlas, respectively. Detailed can refer to Liu et al. (2011, 2013).  
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 problems of storing and wireless transmission, data from 5 July to 24 August, were not collected. (2) The dataset contained the following variables: Date/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 \*.xlsx format. Moreover, suspicious data were marked in red.  
For more information, please refer to Liu et al. (2018) (for sites information), Liu et al. (2011) (for data processing) in the Citation section.

2、Keywords

Theme：Radiation,Sensible heat flux  
Discipline：Atmosphere  
Places：the cold region hydrology experimental area, Arou Superstation, Heihe River Basin  
Time：2018

3、Data details

1.Scale：None

2.Projection：None

3.Filesize：0.51MB

4.Data format：None

4、Space scope

|  |  |  |
| --- | --- | --- |
| - | north：38.057 | - |
| west：100.471 | - | east：100.471 |
| - | south：38.038 | - |

5、Time frame:2018-01-18 08:00:00+00:00--2019-01-17 08:00:00+00:00

6、Reference method

References to data:

TAN Junlei, LI Xin, XU Ziwei, CHE Tao, ZHANG Yang. Qilian mountains integrated observatory network: Dataset of Heihe integrated observatory network (large aperture scintillometer of A'rou superstation, 2018). A Big Earth Data Platform for Three Poles, doi:10.11888/Meteoro.tpdc.2707672019

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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  
  
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.

7、Supporting project information

Pan-Third Pole Environment Study for a Green Silk Road-A CAS Strategic Priority A Program  
the National Natural Science Foundation of China “Key Theory and Methods for Validation of Land Surface Remote Sensing Products”

8、Data resource provider

name: XU Ziwei  
unit: Beijing Normal University  
email: xuzw@bnu.edu.cn  
  
name: TAN Junlei  
unit:   
email: tanjunlei@163.com  
  
name: ZHANG Yang  
unit:   
email: zhangyang@lzb.ac.cn  
  
name: LI Xin  
unit:   
email: xinli@itpcas.ac.cn  
  
name: CHE Tao  
unit:   
email: chetao@lzb.ac.cn