A Big Earth Data Platform for Three Poles

**Qilian Mountains integrated observatory network: Dataset of Heihe integrated observatory network (Large aperture scintillometer of Sidaoqiao Superstation, 2021)**

1、Description

This dataset contains the flux measurements from the large aperture scintillometer (LAS) at Sidaoqiao Superstation in the Heihe integrated observatory network from January 1 to December 31 in 2021. There were BLS900 and BLS450 at Sidaoqiao Superstation. The north towers were set up with these instruments’ receivers and the south towers were transmitters. The site (north: 101.137° E, 42.008° N; south: 101.131° E, 41.987 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 LAS was 25.5 m, and the path length was 2350 m. The data were sampled 1 minute.
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&BLS450：Cn2>7.25E-14). (2) The data were rejected when the demodulation signal was small (BLS900&BLS450：Average X Intensity<1000). (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) were selected for BLS900 and BLS450. Detailed can refer to Liu et al. (2011, 2013). Due to instrument adjustment and inadequate power supply, the date of missing data for the large aperture scintillator is: 2021.03.15-2021.03.18；2021.9.12-2021.9.18.
Several instructions were included with the released data. (1) The las data are firstly from BLS900, followed by BLS450, and finally the final missing data was marked with-6999. (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, 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.
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：Hydrology
Discipline：Atmosphere,Terrestrial Surface
Places：Sidaoqiao superstation, the natural oasis eco-hydrology experimental area in the lower reaches, The Lower Reaches of Heihe River Basin
Time：2021

3、Data details

1.Scale：None

2.Projection：

3.Filesize：0.5MB

4.Data format：None

4、Space scope

|  |  |  |
| --- | --- | --- |
| - | north：42.008 | - |
| west：101.131 | - | east：101.137 |
| - | south：41.987 | - |

5、Time frame:2020-12-31 16:00:00+00:00--2021-12-30 16:00:00+00:00

6、Reference method

References to data:

LIU Shaomin, ZHANG Yang, XU Ziwei, REN Zhiguo, TAN Junlei, CHE Tao. Qilian Mountains integrated observatory network: Dataset of Heihe integrated observatory network (Large aperture scintillometer of Sidaoqiao Superstation, 2021). A Big Earth Data Platform for Three Poles, doi:10.11888/Meteoro.tpdc.2714302022

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.

7、Supporting project information

Pan-Third Pole Environment Study for a Green Silk Road-A CAS Strategic Priority A Program

8、Data resource provider

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