A Big Earth Data Platform for Three Poles

**Qilian Mountains integrated observatory network: Dataset of Heihe integrated observatory network (eddy covariance system of Dashalong station, 2019)**

1、Description

This dataset contains the flux measurements from the Dashalong station eddy covariance system (EC) in the upstream reaches of the Heihe integrated observatory network from January 1 to December 31 in 2019. The site (98.9406° E, 38.8399° N) was located in the Qilian County in Qinghai Province. The elevation is 3739 m. The EC was installed at a height of 4.5 m, and the sampling rate was 10 Hz. The sonic anemometer faced north, and the separation distance between the sonic anemometer and the CO2/H2O gas analyzer (CSAT3&Li7500RS) was 0.15 m.
The raw data acquired at 10 Hz were processed using the Eddypro post-processing software, including the spike detection, lag correction of H2O/CO2 relative to the vertical wind component, sonic virtual temperature correction, coordinate rotation (2-D rotation), corrections for density fluctuation (Webb-Pearman-Leuning correction), and frequency response correction. The EC data were subsequently averaged over 30 min periods. The observation data quality was divided into three classes according to the quality assessment method of stationarity (Δst) and the integral turbulent characteristics test (ITC): class 1-3 (high quality), class 4-6 (good), class 7-8 (poor, better than gap filling data), class9 (rejected). In addition to the above processing steps, the half-hourly flux data were screened in a four-step procedure: (1) data from periods of sensor malfunction were rejected; (2) data collected before or after 1 h of precipitation were rejected; (3) incomplete 30 min data were rejected when the missing data constituted more than 3% of the 30 min raw record; and (4) data were rejected at night when the friction velocity (u\*) was less than 0.1 m/s. There were 48 records per day, and the missing data were replaced with -6999. Suspicious data were marked in red. Due to the power loss and the problems of datalogger, data were missing occasionally in the first half of year. Data during June 18 to July 29, 2019 were missing due to the malfunction of datalogger and CF card.
The released data contained the following variables: data/time, wind direction (Wdir, °), wind speed (Wnd, m/s), the standard deviation of the lateral wind (Std\_Uy, m/s), virtual temperature (Tv, ℃), H2O mass density (H2O, g/m3), CO2 mass density (CO2, mg/m3), friction velocity (ustar, m/s), stability (z/L), sensible heat flux (Hs, W/m2), latent heat flux (LE, W/m2), carbon dioxide flux (Fc, mg/ (m2s)), quality assessment of the sensible heat flux (QA\_Hs), quality assessment of the latent heat flux (QA\_LE), and quality assessment of the carbon flux (QA\_Fc). 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 \*.xls format. Detailed information can be found in the suggested references.
For more information, please refer to Liu et al. (2018) and Che et al. (2019) (for sites information), Liu et al. (2011) for data processing) in the Citation section.

2、Keywords

Theme：Atmospheric Radioactive Substance,Hydrology
Discipline：Atmosphere,Terrestrial Surface,Cryosphere
Places：Upper reaches of the Heihe River
Time：2019

3、Data details

1.Scale：None

2.Projection：

3.Filesize：2.39MB

4.Data format：None

4、Space scope

|  |  |  |
| --- | --- | --- |
| - | north：38.8399 | - |
| west：98.9406 | - | east：98.9406 |
| - | south：38.8399 | - |

5、Time frame:2019-01-15 08:00:00+00:00--2020-01-14 08:00:00+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 (eddy covariance system of Dashalong station, 2019). A Big Earth Data Platform for Three Poles, doi:10.11888/Meteoro.tpdc.2706872020

References to articles:

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.

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

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