A Big Earth Data Platform for Three Poles

**Qilian Mountains integrated observatory network: Dataset of Heihe integrated observatory network (eddy covariance system of Zhangye wetland station, 2018)**

1、Description

This dataset contains the flux measurements from the Zhangye wetland station eddy covariance system (EC) in the midstream reaches of the Heihe integrated observatory network from January 1 to December 31 in 2018. The site (100.44640° E, 38.97514° N) was located in the Zhangye City in Gansu Province. The elevation is 1460 m. The EC was installed at a height of 5.2 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 (Gill&Li7500A) was 0.25 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. There were 48 records per day, and the missing data were replaced with -6999. Suspicious data were marked in red. Flux data during March 25 to May 10, 2018 were wrong to the sensor malfunction.
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) (for sites information), Liu et al. (2011) for data processing) in the Citation section.

2、Keywords

Theme：Atmospheric Radioactive Substance
Discipline：Atmosphere
Places：Middle reaches of Heihe River, The artificial oasis experimental area, Zhangye wetland station
Time：2018

3、Data details

1.Scale：None

2.Projection：None

3.Filesize：2.97MB

4.Data format：None

4、Space scope

|  |  |  |
| --- | --- | --- |
| - | north：38.97514 | - |
| west：100.4464 | - | east：180.0 |
| - | south：38.97514 | - |

5、Time frame:2018-01-16 00:00:00+00:00--2019-01-15 00:00:00+00:00

6、Reference method

References to data:

TAN Junlei, LI Xin, LIU Shaomin, XU Ziwei, CHE Tao, REN Zhiguo. Qilian Mountains integrated observatory network: Dataset of Heihe integrated observatory network (eddy covariance system of Zhangye wetland station, 2018). A Big Earth Data Platform for Three Poles, doi:10.11888/Meteoro.tpdc.2707832019

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. doi:10.2136/vzj2018.04.0072.

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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