A Big Earth Data Platform for Three Poles

**Qilian Mountains integrated observatory network: Dataset of Qinghai Lake integrated observatory network (eddy covariance system of Yulei station on Qinghai lake, 2020)**

1、Description

This dataset contains the flux measurements from the Qinghai Lake eddy covariance system (EC) belonging to the Qinghai Lake basin integrated observatory network from January 1 to December 31 in 2020. Due to the terrible climate in winter and spring, those instruments need maintenance in time. However, the Covid-19 blocked our maintenance, those data in January 1 to April 6 and November 1 to December 31 in 2020 were missing. The effective range of latent heat flux is -500~500 W/m2. The negative value may be caused by condensed water. The site (100° 29' 59.726'' E, 36° 35' 27.337'' N) was located on the Yulei Platform in Erlangjian scenic area, Qinghai Province. The elevation is 3209m. The EC was installed at a height of 16.1m, 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 about 0.17 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.
The released data contained the following variables: DATE/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). The quality marks of sensible heat flux, latent heat flux and carbon flux are divided into three levels (quality marks 0 have good data quality, 1 have good data quality and 2 have poor data quality). 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.

2、Keywords

Theme：Latent heat flux,Radiation,Carbon dioxide flux,Sensible heat flux
Discipline：Atmosphere
Places：Qinghai Lake Basin
Time：2020

3、Data details

1.Scale：None

2.Projection：

3.Filesize：2.52MB

4.Data format：None

4、Space scope

|  |  |  |
| --- | --- | --- |
| - | north：36.59 | - |
| west：100.5 | - | east：100.5 |
| - | south：36.59 | - |

5、Time frame:2019-12-31 16:00:00+00:00--2020-12-30 16:00:00+00:00

6、Reference method

References to data:

Li Xiaoyan. Qilian Mountains integrated observatory network: Dataset of Qinghai Lake integrated observatory network (eddy covariance system of Yulei station on Qinghai lake, 2020). A Big Earth Data Platform for Three Poles, doi:10.11888/Atmos.tpdc.2721532021

References to articles:

Li, X.Y., Yang, X.F., Ma, Y.J., Hu, G.R., Hu, X., Wu, X.C., Wang, P., Huang, Y.M., Cui, B.L., & Wei, J.Q. (2018). Qinghai Lake Basin Critical Zone Observatory on the Qinghai-Tibet Plateau. Vadose Zone Journal, 17(1).

Li, X.Y., Ma, Y.J., Huang, Y.M., Hu, X., Wu, X.C., Wang, P., Li, G.Y., Zhang, S.Y., Wu, H.W., Jiang, Z.Y., Cui, B.L., & Liu, L. (2016). Evaporation and surface energy budget over the largest high-altitude saline lake on the Qinghai-Tibet Plateau. Journal of Geophysical Research: Atmospheres, 121(18), 10470-10485.

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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