A Big Earth Data Platform for Three Poles

**The development of devices monitoring ecosystem energy and water flux: Two-wavelength scintillometer (2018, 2021)**

1、Description

This dataset contains the flux measurements from the scintillometer at Arou Superstation in the Heihe integrated observatory network. The north tower was set up with the receiver, and the south tower was equipped with transmitter. 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 13.0 m, and the path length was 2390 m.
The raw data acquired at 1 min intervals for the near infrared scintillometer and 200 Hz for the optical &microwave scintillometer were processed and quality controlled. The data were subsequently averaged over 30 min periods, in which sensible heat and latent 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) raw data processing and calculating the intensity variance. (2) Calculating the structural parameters of air refractive index. (3) Calculating the meteorological structural parameters. (4) Calculating the sensible and latent heat flux。
The dataset contained the following variables: Date/time (yyyy/m/d h:mm), the structural parameter of the air refractive index for near infrared scintillometer (Cn2, m-2/3), intensity variance for LAS, MWS and OMS (Var\_LAS, Var\_MWS, Var\_OMS), the sensible heat flux (H, W/m^2), and the latent heat flux (LE, 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：Latent heat flux,Latent heat,Hydrology
Discipline：Terrestrial Surface
Places：Upper reaches of Heihe River, Arou Superstation
Time：2020, 2018

3、Data details

1.Scale：None

2.Projection：

3.Filesize：1.03MB

4.Data format：None

4、Space scope

|  |  |  |
| --- | --- | --- |
| - | north：38.0568 | - |
| west：100.4572 | - | east：100.4712 |
| - | south：38.0384 | - |

5、Time frame:2017-12-31 16:00:00+00:00--2018-12-30 16:00:00+00:00

6、Reference method

References to data:

LIU Shaomin, XU Ziwei, SHI Shengjin. The development of devices monitoring ecosystem energy and water flux: Two-wavelength scintillometer (2018, 2021). A Big Earth Data Platform for Three Poles, doi:10.11888/Hydro.tpdc.2717912021

References to articles:

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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., Li, X., Xu, Z., Che, T., Xiao, Q., Ma, M., Liu, Q., Jin, R., Guo, J., Wang, L., Wang, W., Qi, Y., Li, H., Xu, T., Ran, Y., Hu, X., Shi, S., Zhu, Z., Tan, J., Zhang, Y., Ren, Z. (2018). The Heihe Integrated Observatory Network: A basin‐scale land surface processes observatory in China. Vadose Zone Journal, 17,180072. https://doi.org/10.2136/vzj2018.04.0072.

7、Supporting project information

The development of devices monitoring ecosystem energy and water flux

8、Data resource provider

name: XU Ziwei
unit: Beijing Normal University
email: xuzw@bnu.edu.cn

name: SHI Shengjin
unit: Beijing Rainroot Scientific Co., Ltd.
email:

name: LIU Shaomin
unit: Beijing Normal University
email: smliu@bnu.edu.cn