A Big Earth Data Platform for Three Poles

**WATER: Dataset of ground truth measurement synchronizing with the airborne WiDAS mission in the Yingke oasis and Huazhaizi desert steppe foci experimental areas on June 1, 2008**

1、Description

The dataset of ground truth measurement synchronizing with the airborne WiDAS mission was obtained in the Yingke oasis and Huazhaizi desert steppe foci experimental areas on Jun. 1, 2008. WiDAS, composed of four CCD cameras, one mid-infrared thermal imager (AGEMA 550), and one infrared thermal imager (S60), can acquire CCD, MIR and TIR band data. The simultaneous ground data included:  
 (1) The radiative temperature of maize, wheat and the bare land in Yingke oasis maize field and Huazhaizi desert No. 1 plot by ThermaCAM SC2000 (1.2m above the ground, FOV = 24°×18°). The data included raw data (read by ThermaCAM Researcher 2001), recorded data and the blackbody calibrated data (archived in Excel format).  
 (2) The radiative temperature by the automatic thermometer (FOV: 10°; emissivity: 1.0; from Institute of Remote Sensing Applications), observing straight downwards at intervals of 1s in Yingke oasis maize field. Raw data, blackbody calibrated data and processed data were all archived in Excel format.  
 (3) FPAR (Fraction of Photosynthetically Active Radiation) of maize and wheat by SUNSACN and the digital camera in Yingke oasis maize field. FPAR= (canopyPAR－surface transmissionPAR－canopy reflection PAR+surface reflectionPAR) /canopy PAR; APAR=FPAR\* canopy PAR. Data were archived in Excel format.  
 (4) The reflectance spectra by ASD in Yingke oasis maize field (350-2500nm , from BNU, the vertical canopy observation and the transect observation), and Huazhaizi desert No. 1 plot (350-2500nm , from Cold and Arid Regions Environmental and Engineering Research Institute, CAS, the NE-SW diagonal observation at intervals of 30m). The data included raw data (in .doc format), recorded data and the blackbody calibrated data (in Excel format).  
 (5) Maize albedo by the shortwave radiometer in Yingke oasis maize field. R =10H (R for FOV radius; H for the probe height). Data were archived in Excel format.  
 (6) The radiative temperature by the handheld radiometer in Yingke oasis maize field (from BNU, the vertical canopy observation, the transect observation and the diagonal observation), Yingke oasis wheat field (only for the transect temperature), and Huazhaizi desert No. 1 plot (the NE-SW diagonal observation). Besides, the maize radiative temperature and the physical temperature were also measured both by the handheld radiometer and the probe thermometer in the maize plot of 30m near the resort. The data included raw data (in .doc format), recorded data and the blackbody calibrated data (in Excel format).  
 (7) Atmospheric parameters on the playroom roof at the resort by CE318 (produced by CIMEL in France). The underlying surface was mainly composed of crops and the forest (1526m high). The total optical depth, aerosol optical depth, Rayleigh scattering coefficient, column water vapor in 936 nm, particle size spectrum and phase function were then retrieved from these observations. The optical depth in 1020nm, 936nm, 870nm, 670nm and 440nm were all acquired by CE318. Those data include the raw data in .k7 format and can be opened by ASTPWin. ReadMe.txt is attached for detail. Processed data (after retrieval of the raw data) in Excel format are on optical depth, rayleigh scattering, aerosol optical depth, the horizontal visibility, the near surface air temperature, the solar azimuth, zenith, solar distance correlation factors, and air column mass number.  
 (8) Narrow channel emissivity of the bare land and vegetation by the W-shaped determinator in Huazhaizi desert No. 1 plot. Four circumstances should be considered for emissivity, with the lid plus the au-plating board, the au-plating board only, the lid only and without both. Data were archived in Word.

2、Keywords

Theme：Photosynthetically active radiation,Emissivity,Radiation,Canopy spectrum,Vegetation,Aerosol,Aerosol optical depth/Thickness,Terrestrial Surface Remote Sensing,Ground verification information  
Discipline：Atmosphere,Terrestrial Surface  
Places：Heihe River Basin, Arid Region Hydrology in the Middle Reaches,   
Time：

3、Data details

1.Scale：None

2.Projection：4326

3.Filesize：223.7MB

4.Data format：

4、Space scope

|  |  |  |
| --- | --- | --- |
| - | north：38.88 | - |
| west：100.289 | - | east：100.46 |
| - | south：38.734 | - |

5、Time frame:2018-12-01 02:48:21+00:00--2018-12-01 02:48:21+00:00

6、Reference method

References to data:

GUANG Jie, GE Yingchun, SHU Lele, CHEN Shaohui, TAO Xin, CHENG Zhanhui, LIU Xiaocheng, XIN Xiaozhou, LI Xin, REN Zhixing, ZHANG Wuming, YAN Guangkuo, WANG Ying, YANG Tianfu, ZHOU Chunyan, LIANG Wenguang, REN Huazhong, XU Zhen, LI Li, ZHANG Yang, CHEN Ling, LIU Sihan, LI Xiaoyu, HUANG Chunlin, JIANG Xi, Liu Liangyun, HE Tao. WATER: Dataset of ground truth measurement synchronizing with the airborne WiDAS mission in the Yingke oasis and Huazhaizi desert steppe foci experimental areas on June 1, 2008. A Big Earth Data Platform for Three Poles, doi:10.3972/water973.0125.db2015

References to articles:

Liu Q, Yan CY, Xiao Q, Yan GJ, Fang L. Separating vegetation and soil temperature using airborne multiangular remote sensing image data. International Journal of Applied Earth Observation and Geoinformation, 2012, 17: 66-75, doi:10.1016/j.jag.2011.10.003.

7、Supporting project information

The CAS (Chinese Academy of Sciences) Action Plan for West Development Project  
National Program on Key Basic Research Project (973 Program

8、Data resource provider

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