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 May 30, 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 May 30, 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 by the handheld radiometer (BNU) in Yingke oasis maize field and Huazhaizi desert maize field (the vertical canopy observation and the transect observation for both fields), and Huazhaizi desert No. 2 plot (the diagonal observation). The data included raw data (in .doc format), recorded data and the blackbody calibrated data (in Excel format).  
 (2) The component temperature of maize and wheat by the handheld radiometer in Yingke oasis maize field, Yingke wheat field and Huazhaizi desert maize field. For maize, the component temperature included the vertical canopy temperature, the bare land temperature and the plastic film temperature; for the wheat, it included the vertical canopy temperature, the half height temperature, the lower part temperature and the bare land temperature. The data included raw data (in .doc format), recorded data and the blackbody calibrated data (in Excel format).  
 (3) The radiative temperature of maize, wheat and the bare land in Yingke oasis maize field 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).  
 (4) The radiative temperature and the canopy multi-angle radiative temperature by the fixed automatic thermometer (FOV: 10°; emissivity: 1.0), observing straight downwards at intervals of 1s in Yingke oasis maize field (2 instruments for maize canopy), Huazhaizi desert maize field (only one for maize canopy) and Huazhaizi desert No. 2 plot (two for reaumuria soongorica canopy and the bare land). The thermal infrared remote sensing calibration was carried out in the resort plot. Raw data, blackbody calibrated data and processed data were all archived in Excel format.  
 (5) Coverage fraction of maize and wheat by the self-made instrument and the camera (2.5m-3.5m above the ground) in Yingke oasis maize field. Based on the length of the measuring tape and the bamboo pole, the size of the photo can be decided. GPS date were also collected and the technology LAB was applied to retrieve the coverage of the green vegetation. Besides, such related information as the surrounding environment was also recorded. Data included the primarily measured image and final fraction of vegetation coverage.  
 (6) Reflectance spectra of Yingke oasis maize field (350-2500nm, from Institute of Remote Sensing Applications) and resort calibration site (350-2500nm, from Beijing Univeristy) by ASD (Analytical Sepctral Devices); BRDF by the self-made observation platform. Raw data were binary files direct from ASD (by ViewSpecPro), and pre-processed data on reflectance were in Excel format.  
 (7) Atmospheric parameters at the resort calibration site by CE318 (produced by CIMEL in France). 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) Soil moisture (0-40cm) by the cutting ring, the soil temperature by the thermocouple thermometer, roughness by the self-made roughness board and the camera in Huazhaizi desert No. 1 plot. Sample points were selected every 30m along the diagonals. Data were all archived in Excel format.  
 (9) 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.  
 (10) FPAR (Fraction of Photosynthetically Active Radiation) 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 Word.  
 LAI in Yingke oasis maize field. The maximum leaf length and width of each maize and wheat were measured. Data were archived in Excel format of May 31.

2、Keywords

Theme：Photosynthetically active radiation,Aerosol radiance,Canopy spectrum,Vegetation,Aerosol,Aerosol optical depth/Thickness,Vegetation cover,Terrestrial Surface Remote Sensing,Ground verification information  
Discipline：Atmosphere,Terrestrial Surface  
Places：Heihe River Basin, Arid Region Hydrology in the Middle Reaches,   
Time：2008,

3、Data details

1.Scale：None

2.Projection：4326

3.Filesize：484.9MB

4.Data format：

4、Space scope

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

5、Time frame:2018-11-30 02:47:54.069370+00:00--2018-11-30 02:47:54.069374+00:00

6、Reference method

References to data:

LI Shihua, ZOU Jie, REN Huazhong, XU Zhen, WANG Haoxing, WANG Dacheng, HE Tao, LUO Zhen, KANG Guoting, GUANG Jie, GE Yingchun, SHU Lele, TAO Xin, WANG Jianhua, ZHANG Wuming, HUANG Bo, YANG Tianfu, ZHOU Chunyan, LIANG Wenguang, CHAI Yuan, ZHANG Yang, CHEN Ling, LIU Sihan, LI Xiaoyu, CHENG Zhanhui, LIU Xiaocheng, XIN Xiaozhou, REN Zhixing, QIAN Yonggang. WATER: Dataset of ground truth measurement synchronizing with the airborne WiDAS mission in the Yingke oasis and Huazhaizi desert steppe foci experimental areas on May 30, 2008. A Big Earth Data Platform for Three Poles, doi:10.3972/water973.0124.db2015

References to articles:

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

name: GUANG Jie  
unit: Institute of Remote Sensing and Digital Earth, Chinese Academy of Sciences  
email: guangjie@radi.ac.cn  
  
name: XIN Xiaozhou  
unit: Institute of Remote Sensing Application, Chinese Academy of Sciences  
email:   
  
name: GE Yingchun  
unit:   
email: gtw@lzb.ac.cn  
  
name: ZHANG Yang  
unit:   
email: zhangyang@lzb.ac.cn  
  
name: WANG Jianhua  
unit: Cold and Arid Regions Environmental and Engineering Research Institute, Chinese Academy of Sciences  
email: jhwang@lzb.ac.cn  
  
name: LI Shihua  
unit:   
email:   
  
name: SHU Lele  
unit:   
email:   
  
name: XU Zhen  
unit:   
email:   
  
name: LI Xiaoyu  
unit:   
email:   
  
name: CHAI Yuan  
unit:   
email:   
  
name: CHEN Ling  
unit:   
email:   
  
name: KANG Guoting  
unit:   
email:   
  
name: QIAN Yonggang  
unit:   
email:   
  
name: REN Huazhong  
unit:   
email: Renhuazhong@mail.bnu.edu.cn  
  
name: WANG Haoxing  
unit:   
email:   
  
name: ZHOU Chunyan  
unit:   
email:   
  
name: TAO Xin  
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name: LIU Sihan  
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name: CHENG Zhanhui  
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