A Big Earth Data Platform for Three Poles

**WATER: Dataset of ground truth measurement synchronizing with the airborne WiDAS mission and Landsat TM in the Yingke oasis and Huazhaizi desert steppe foci experimental areas on Jul. 7, 2008**

1、Description

The dataset of ground truth measurement synchronizing with the airborne WiDAS mission and Landsat TM was obtained in the Yingke oasis and Huazhaizi desert steppe foci experimental areas on Jul. 7, 2008. Observation items included:
 (1) the radiative temperature by the thermal camera (Institute of Remote Sensing Applications) of maize, wheat and the bare land of Yingke oasis maize field at a height of 1.2m above the ground. Optical photos of the scene were also taken. Raw data (read by ThermaCAM Researcher 2001) was archived in IMG format, and blackbody calibrated data and processed data were all archived as Excel files.
 (2) 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.
 (3) Reflectance spectra in Yingke oasis maize field by ASD FieldSpec (350-1603nm) from Institute of Remote Sensing Applications (CAS). The grey board and the black and white cloth were also used for calibration on the CCD camera. Raw data were binary files direct from ASD (by ViewSpecPro), and pre-processed data on reflectance were in Excel format.
 (4) the component temperature by the handheld radiometer in Yingke oasis maize 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 Word format), recorded data and the blackbody calibrated data (in Excel format).
 (5) the radiative temperature by the handheld radiometer (emissivity = 1.0) in Yingke oasis maize field (for the canopy mean temperature), Huazhaizi desert maize field (for the transect temperature), Zhangye airport (the black and white cloth for calibration) and Huazhaizi desert No. 2 plot (the diagonal radiative temperature and the radiative temperature of 30m\*30m subplot). The component temperature was also measured. The data included raw data (in Word format), recorded data and the blackbody calibrated data (as Excel files).
 (6) The air temperature (°C) , the soy bean leaf temperature (°C) and the maize leaf temperature (°C) by SPAD (from Institute of Remote Sensing Applications (CAS)) in Yingke oasis maize field. Besides, spectrum, photosynthesis, fluorescence and chlorophyll were measured as well.
 (7) The leaf reflectance spectra ASD (serial number: 64831) and 50% grey board from Institute of Remote Sensing Applications (CAS). The spectral DN was changed into radiance based on the 50% grey board calibration data and calibration lamp data, which could further be transformed into Excel format. Moreover, the solar radiance=the reference board radiance/the reference reflectance.
 (8) The leaf fluorescence by ImagingPam from Beijing Academy of Agriculture and Forestry Sciences. YII = (Fm'-F)/Fm' was applied for caculation, F indicating fluorescence before saturating flash light, Fm' the maximum fluorescence before saturating flash light, and YII the quantum yield of photosystem II. Data were archived in pim and could be read by ImagingPam, which can be downloaded from http://www.zealquest.com.
 (9) The leaf photosynthesis by LI-6400.
 (10) The radiative temperature by the automatic thermometer (FOV: 10°; emissivity: 0.95), observing straight downwards at intervals of 1s in Yingke oasis maize field and Huazhaizi desert maize field. Raw data, blackbody calibrated data and processed data were all archived in Excel format.
 (11) 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 the table format of Word.
 (12) Atmospheric parameters near Daman Water Management office 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.

2、Keywords

Theme：Canopy spectrum,Vegetation,Chlorophyll,Aerosol,Aerosol optical depth/Thickness,Canopy reflected radiation,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：224.9MB

4.Data format：

4、Space scope

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

5、Time frame:2008-07-20 00:00:00+00:00--2008-07-20 00:00:00+00:00

6、Reference method

References to data:

WANG Tianxing, HAO Xiaohua, ZHU Xiaohua, WANG Shuguo, YAN Guangkuo, ZHOU Mengwei, LI Hua, YANG Guijun, ZHOU Chunyan, XIA Chuanfu, REN Huazhong, LI Li, CHEN Ling, YU Fan, SU Gaoli, LIU Sihan, Liu Liangyun, LI Xinhui, CHENG Zhanhui, XIN Xiaozhou. WATER: Dataset of ground truth measurement synchronizing with the airborne WiDAS mission and Landsat TM in the Yingke oasis and Huazhaizi desert steppe foci experimental areas on Jul. 7, 2008. A Big Earth Data Platform for Three Poles, doi:10.3972/water973.0132.db2015

References to articles:

刘强, 肖青, 刘志刚, 方莉, 彭菁菁, 李波. 黑河综合遥感联合试验中机载WIDAS数据的预处理方法. 遥感技术与应用, 2010, 25(6): 797-804.

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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