A Big Earth Data Platform for Three Poles

**HiWATER: Dataset of differential GPS in the middle and upper reaches of the Heihe River Basin (2012)**

1、Description

The purpose of differential GPS positioning survey is to unify multiple survey areas into the same coordinate system and realize accurate absolute positioning through joint survey with national high-level control point coordinates. Under the national geodetic coordinate system of 2000, the accurate positioning of flux observation matrix, hulugou small watershed, tianmuchi small watershed and dayokou watershed and target is completed. In order to realize the geometric correction and absolute positioning of optical image, SAR image and airborne lidar data, the layout of ground control points and high-precision measurement are completed. In the middle reaches of the area, one national high-level control point is jointly surveyed in the five directions of East, South, West, North and middle. Measuring instrument:   
There are 3 sets of triple R8 GNSS system.   
Measurement principle:   
For the control network encryption point, it is connected with the high-level known points in four quadrants around the survey area and distributed evenly in the survey area. For the ground control point (GCP), the obvious characteristic points (such as house corner, road intersection, inflection point, etc.) of the ground layout target and the independent ground objects are adopted and evenly distributed in the survey area. For the ground points with high accuracy requirements, the principle of average value of multiple (at least three) measurements is adopted.   
Measurement method:   
In the test area, the control network is encrypted, and GPS static measurement and national high-level control network are used for joint measurement and calculation. During measurement, multiple GPS receivers conduct static synchronous observation at different stations, and the observation time is strictly in accordance with the control network measurement specifications.   
The ground points in the test area are accurately located. GPS-RTK positioning technology is used and the national high-level control points are used to calibrate to the local coordinate system. When the mobile station obtains the fixed solution during the coordinate acquisition, the measurement is carried out again and the single measurement lasts for 5S.   
Measuring position:   
(1) Flux observation matrix   
17 stations, Las tower, waternet, soilnet and bnunet nodes in the core area of flux observation matrix; ground control points in CASI flight area; ground corner reflector positions in radar coverage area; ground target positions in lidar flight area.   
(2) Hulugou small watershed   
Ground target location of lidar flight area.   
(3) Tianmuchi small watershed   
Ground target location of lidar flight area.   
(4) Dayokou Basin   
Satellite image geometric correction ground control point.   
Data format:   
GPS static survey, the original data format is ". Dat" and ". T01" (or ". T02") files (or converted renix data) and "field record". GPS-RTK survey, the original project is ". Job" file (or converted ". DC" file).   
The test results are submitted in the format of exported ". CSV" data, which can be viewed and edited by Excel software.   
Measurement time:   
June 19, 2012 to July 30, 2012

2、Keywords

Theme：Terrestrial Surface Remote Sensing,Ground verification information  
Discipline：Terrestrial Surface  
Places：Heihe River Basin, the artificial oasis experimental area in the middle reaches, the cold region hydrology experimental area in the upper reaches  
Time：2012, 2012-06-19 to 2012-07-30

3、Data details

1.Scale：None

2.Projection：4326

3.Filesize：10.0MB

4.Data format：文本, \*.dat后缀

4、Space scope

|  |  |  |
| --- | --- | --- |
| - | north：38.97 | - |
| west：99.12 | - | east：100.58 |
| - | south：38.15 | - |

5、Time frame:2012-07-04 02:13:00+00:00--2012-08-14 02:13:00+00:00

6、Reference method

References to data:

LIU Xiangfeng, MA Mingguo. HiWATER: Dataset of differential GPS in the middle and upper reaches of the Heihe River Basin (2012). A Big Earth Data Platform for Three Poles, doi:10.3972/hiwater.039.2013.db2017

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Che, T., Li, X., Liu, S., Li, H., Xu, Z., Tan, J., Zhang, Y., Ren, Z., Xiao, L., Deng, J., Jin, R., Ma, M., Wang, J., & Yang, X. (2019). Integrated hydrometeorological, snow and frozen-ground observations in the alpine region of the Heihe River Basin, China. Earth System Science Data, 11, 1483-1499

7、Supporting project information

Heihe Watershed Allied Telemetry Experimental Research (HiWATER)

8、Data resource provider

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