

PRECISE PROCESSING OF SPOT-5 HRS AND IRS-P5 STEREO IMAGERY -- FOR THE PROJECT OF WEST CHINA TOPOGRAPHIC MAPPING AT 1:50,000 SCALE

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ABSTRACT:

High-resolution satellite images (HRSI) at sub-5m footprint such as IKONOS, IRS-P5 (CartoSat-1) and SPOT-5 HRG/HRS images are the main data sources for the Project of West China Topographic Mapping (WChTM), which has been approved by the State Council of China in 2006 and will be completed at the end of 2010. Two procedures which are used for this project in practice, i.e. the block-adjustment procedure and automatic DTM generation procedure, are described in this paper. We firstly present an approach for block-adjustment based on Rational Function Model (RFM) with sparse GCPs by using satellite Images. Secondly, we present a matching approach for automatic DTM generation from HRSI. To test the proposed approaches, they have been applied to SPOT-5 images over 1 test-fields, which covers eastern part of Tibet Plateau, China with variable terrain geomorphologic type. In another test we use 23 scenes of IRS-P5 images, which cover Beijing test area of about 21,000 square kilometers. From these experiments, it's shown that with the proposed block-adjustment and DTM generation approach, by using SPOT-5 HRS/HRG and IRS-P5 imagery with small number of GCPs, satisfactory image orientation results and DTM product (after necessary manual editing) can be achieved with a little bit better accuracy than those requirements from the Chinese Surveying and Mapping regulations for 1:50000 topographic maps.

TOPIC: Geometric modeling

ALTERNATIVE TOPIC: Geometric modeling