

## 3D MAPPING FROM HIGH RESOLUTION EROS STEREO DATA

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### ABSTRACT:

High resolution spaceborne sensors providing image data with a pixel resolution of a few meters or even less are getting a central role in remote sensing. Respective missions being operated at present are the Eros, the IKONOS or the QuickBird mission. Among these, Eros as well as IKONOS are also designed to acquire stereoscopic image data.

This paper is devoted to the analysis of panchromatic stereo data acquired from the Eros sensor at a ground resolution of some 2 meters. Eros is equipped with an asynchronous imaging mode, where the sensor is bending backwards during overflight and image acquisition. Due to this dynamical imaging system, high demands are made with respect to the geometric treatment of such data. The following issues will be addressed in the paper:

- Geometric modelling of Eros image data, including utilization of given orbital and imaging parameters as well as optimisation of these parameters using least squares parameter adjustment;
- Investigation of 3D mapping accuracy being inherent to stereoscopic Eros image pairs;
- Discussion of the performance of image matching techniques being applied to Eros stereo data;
- Extraction of 3D information, i.e. terrain models from Eros stereo data.

Demonstration examples will be presented concerning the generation of terrain models from Eros stereo images. Further, the feasibility to revise existing terrain models will be discussed.