Space Borne Stereo Survey by IKONOS for Urban Planning

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The paper describes a project on research of using of space borne stereo survey for urban territories mapping.

In current time there are several satellites used to acquire high resolution stereopairs – OrbView-3, Eros-B, Cartosat-2, Kompsat-2 and others. Considering the results of analysis of different factors, such as: frame size, price, survey productivity, software support, etc., Ikonos sensor data has been chosen.

For experiments we used images on Yekaterinburg city territory. Delivery set included panchromatic data with 1m resolution and multi-spectral data with 4m resolution. Pan sharpening procedure allowed to produce color images with 1m resolution (see Fig.1).

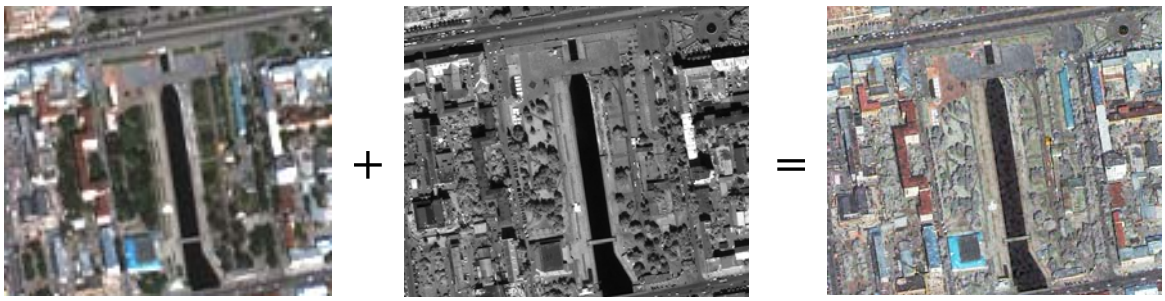

Fig.1 Pan-sharpening process

Photogrammetric processing was done using PHOTOMOD system of v4.0. One of the reasons of using this software is its certification by Space Imaging company (Ikonos data supplier from 1999 to 2006). Relative orientation was done with sub-pixel accuracy. Stereopair was adjusted with plane accuracy less than 1m, and 1-2 m in height. We have also done images interpretation.

It is also possible to build 3D-models of terrain and 3D photogrammetric models of settlements using Ikonos stereopairs (see Fig. 2).

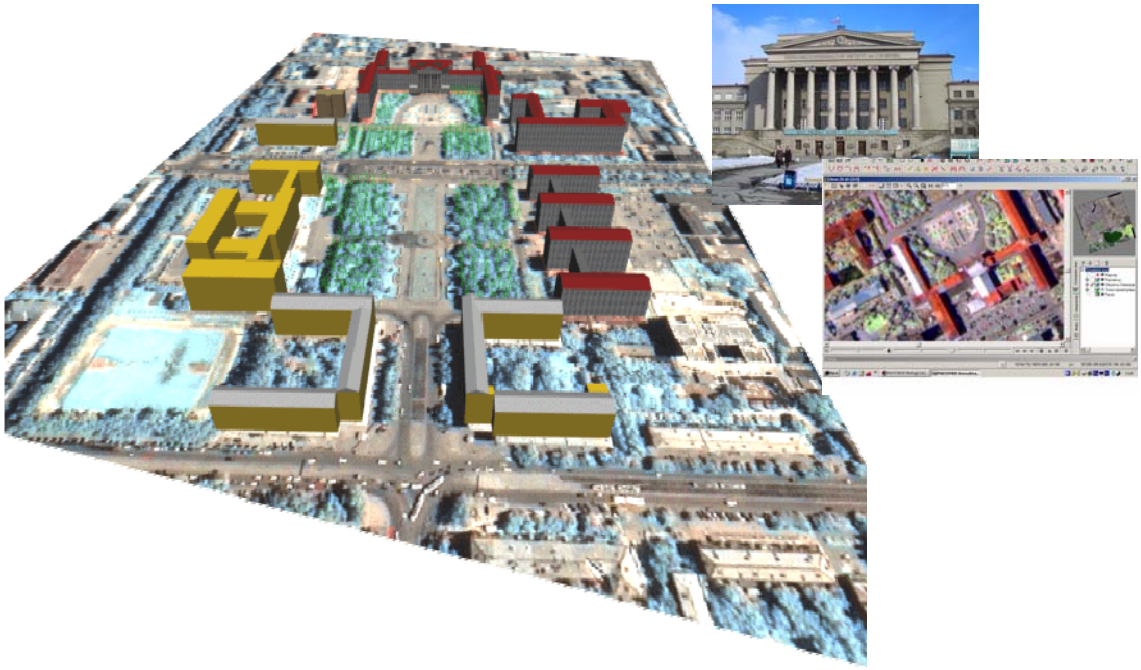

Fig.2 3D modeling of city blocks using Ikonos stereopair.
Area of Ural state technical university in Yekaterinburg

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