

FEASIBILITY STUDY OF RESURS-DK1 SPACE IMAGES FOR CREATING 1:10000 SCALE ORTHOIMAGERY

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Currently high resolution space imagery is used as well as airborne images to create the basis of real-estate objects geospatial data infrastructure.

Research Centre for Earth operative monitoring (NtsOMZ) afforded subscene covering Rzhevskiy and Zubotsovskiy regions of Tverskaya oblast. The image is structure-recovered, dynamic range is 8 bits per pixel, ground sample distance is 1.06 meters, ground swath is full (28 km) while the path length is about 4 km. The size of the image file in TIFF format is 103 Mb.

The site is also covered by airborne imagery acquired in 2006 by RC-30 camera with focal length 150 mm (the imagery scale is 1 : 40000) as well as 300 mm (the imagery scale is 1 : 12000). Besides, ground points data are available, and the inhabited localities are covered by orthoimagery created with respect to MSK-69 local reference system.

In the course of the investigation digital photogrammetric workstation PHOTOMOD 4.3 project was created which includes the single pushbroom space image.

The image orientation was performed involving 10 ground control points which were previously used in airborne imagery of 2006 bundle adjustment. Then the output orthoimagery with respect to local reference system was derived using PHOTOMOD Mosaic module.

The derived orthoimagery was checked by comparison with the 1 : 2000 scale orthoimagery available.

The report includes the residuals between points coordinates measured on the airborne-derived orthoimagery of scale 1 : 2000 and on the orthoimagery derived from the Resurs-DK1 image.

The orthoimagery derived from space image of 1 m resolution acquired by Resurs-DK1 satellite meets the 1 : 10 000 scale map geometric accuracy requirements.

During the source image acquisition the sun elevation was $11^{\circ}48'51''.44$, so the imagery interpretation was difficult because of long dense shadows.

So the sun elevation of the ordered images should be taken into account; it should be above 20° .

The imagery allows to recognize linear objects (roads, rivers etc.), and some separate objects not covered by shadows (single trees, bushes and buildings). It is impossible to recognize point objects like piles.

In our case it can be asserted that the derived orthoimagery is adoptable to create 1:10000 scale photomaps excluding inhabited localities.

The relief of the site is flat and rolling.