PRINCIPLES OF MEASUREMENT OF SURFACES OF EXTRA-TERRESTRIAL TERRITORIES

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In paper principles of measurement of extra-terrestrial territories are observed. Conditions and principles of reception of co-ordinates are presented by a distant method.

Measurement of extra-terrestrial territories is carried out by distant methods. The primary goal of this production engineering is definition of a land-form of space those and sampling of airfields.

At distant researches of a terrestrial surface use geodetic points with known co-ordinates which form a basis for reception of co-ordinates of other points represented in a picture.

Feature of measurement of extra-terrestrial territories is absence on them of a geodetic base or a network of datum points.

Therefore the geodetic base role is played by a space vehicle (SV) path which co-ordinates it is necessary to measure with a split-hair accuracy. In case of not indignant traffic this problem dares easily.

At the solution of the given problem performance of some conditions is required. The first condition. The space vehicle is supplied by the inertial sensor which allows to fix its relative rule in space points during the set moments of a time. It gives the chance to define necessary number of trajectory peaks for definition of parametres of a path.

The second condition. The camera is rigidly fixed on KA and does not change the relative rule in the course of flight on the given section of a path. The third condition. Co-ordinates of a principal point of a picture and a chamber focal length are known.

The production engineering of measurement of surfaces on space installations is based on measurement of co-ordinates of points of these surfaces on which build models of surfaces.

The production engineering of measurement of points of surfaces switches on following stages.

1. Definition of co-ordinates of trajectory peaks KA for definition of parametres of a path.
2. Scaling of parametres of a path of a space vehicle on the measured points.
3. Definition of co-ordinates of points of shooting.
4. Definition of normals to a path in shooting points.
5. Definition of a relative orientation of the chamber in points of shooting with use of a direction of normals.
6. Solution of an intersection under a condition of equality of scales
7. Definition of co-ordinates of points on surface model on steam of pictures
8. Model scaling on path parametres.

The given approach allows to define parametres of installations in the contactless way and provides admissible accuracy of measurements. As basis of reception of co-ordinates projective methods serve [1].

References

1. Ivannikov A.D., Kulagin V.P., Tihonov A.N., Tsvetkov V.JA. Applied geoinformatics. – M.: MaksPress, 2005. – 360 p.

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