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Creation of satellite reference geodetic networks in Uzbekistan for high-precision geodetic instruments

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ABSTRACT: The reference geodetic network is intended for certification of hardware and software systems for determining the location for satellite radio navigation systems (GPS, GLONASS and the like) for various purposes and configuration, including built-in software for processing satellite measurements, which is used to determine coordinates and their increments.

KEY WORDS: Geodetic reference network, linear basis, landfill, survey points, metrological certification.

I. INTRODUCTION

Scientific - experimental studies of new technologies and methods for solving scientific and applied problems of modern four-dimensional spatio-temporal geodesy (satellite geodesic measurements, ground topographic surveys, digital geometric leveling, development of principles for constructing local metrological ranges, improving the design of reference linear and spatial bases and the development of metrological control technology [2].

In the late 90s of Uzbekistan, satellite geodetic equipment and electronic tachometers were widely used in topographic and geodetic production. Accordingly, for metrological verification, the need arose to create reference geodetic bases. In this regard, the Bulungur reference geodetic basis in the Samarkand region was transformed into a linear basis. The reference geodetic was created according to the guiding technical material "General technical requirements for geodetic ranges for metrological certification of geodetic instruments". The Bulungur reference geodetic network is included as one of the parties, and the existing state geodetic points are also included. All points are fixed in place by points of type 187, 191 and forced centering is established.

Bulungur reference geodetic network is designed to perform the following types of work in conditions as close as possible to operating conditions:

- a) metrological certification, certification or verification of geodetic instruments;
- b) field testing of new geodetic instruments;
- c) determination and control of various corrections of geodetic instruments;
- d) research of new technologies and methods of geodetic measurements; Certification of the satellite reference geodetic network is performed

Dual-frequency GPS receivers, the observation was performed at different times of the year. The marks of the basis points are determined with the accuracy of leveling of class II.

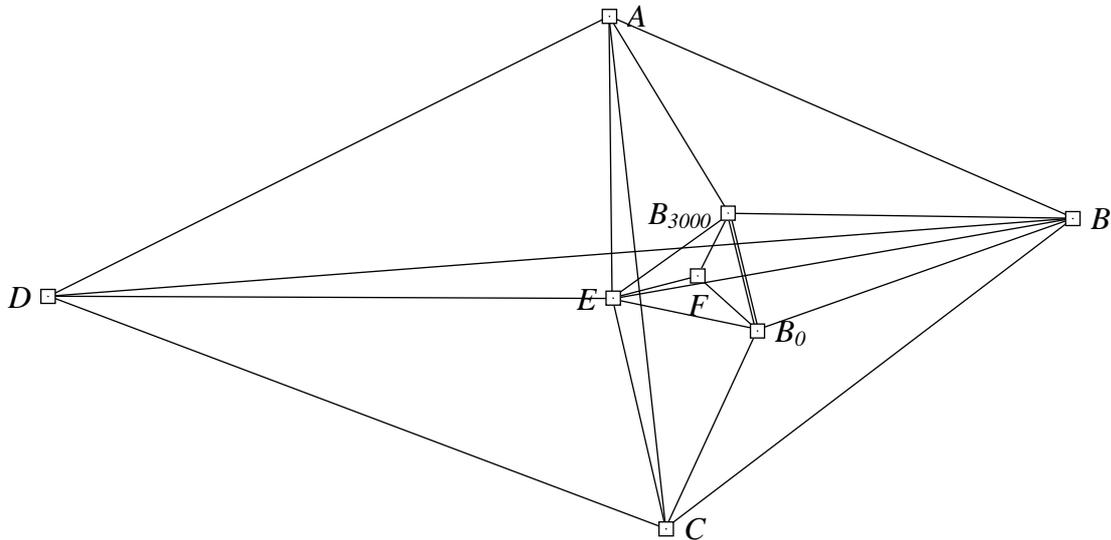


Fig. 1. The geometric scheme of the ESGS is a system of geodesic quadrangles or triangles with the inclusion of a model basis as one of the sides.

Theoretical background

The lengths of the ESGS parties are established taking into account the technical characteristics of the certified equipment and software. The sides of the ESGS within the range of 0.5-1 km, 3-5 km, 10 km, 15 km, 20 km and more than 20 km. The total number of ESGS sides has been set to at least 12. The Bulungur reference geodetic basis is the working standard of the 2nd category.

Main part

It is used for verification, calibration and testing of standard satellite equipment, theodolites, electronic tacheometers, light-range finders and radio-range finders, levels. The root-mean-square error of the measurement of length $(3-5 \times [(10)^{-7} D])$ mm where D in mm. [one].

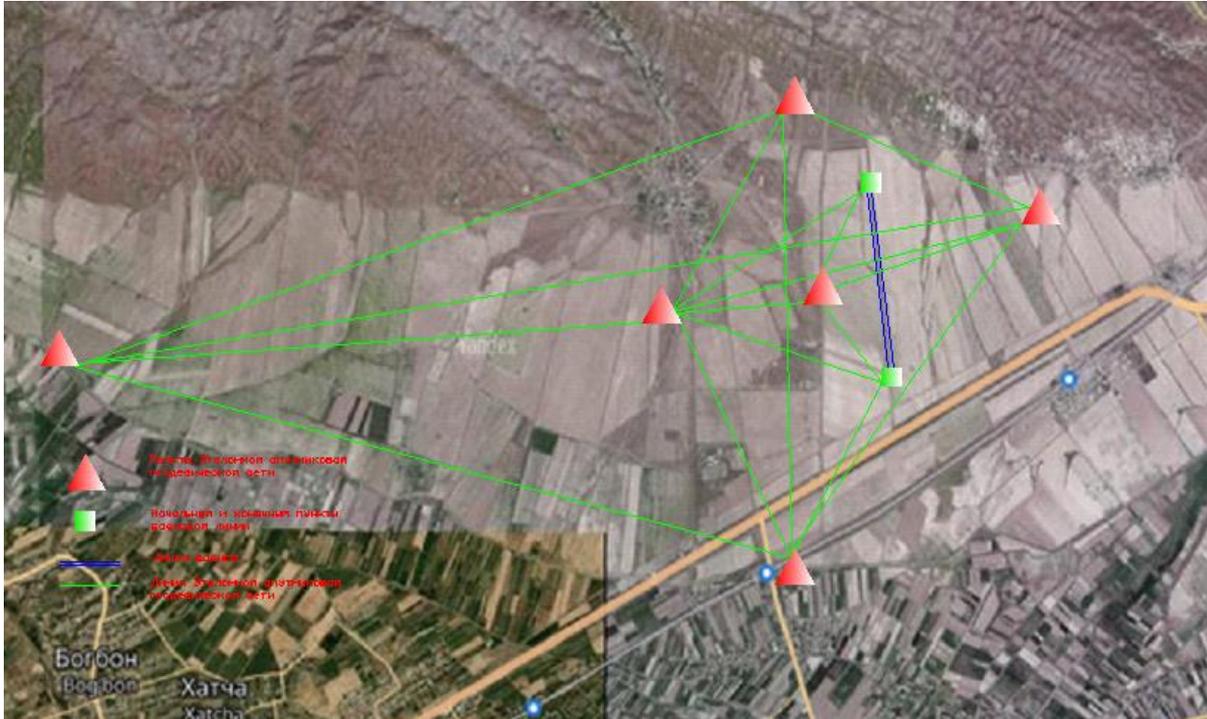


Fig. 2. Bulungur reference satellite geodetic network; included reference basis as one of the parties

When creating an ESGS, a number of fundamentally new tasks arise that need to be addressed: Compliance with requirements related to ESGS and its centers, increases the costs associated with the metrological verification of workers measuring instruments and systems, and such costs should be optimal; The possibility of research as satellite should be considered. equipment, and light-range finders and electronic total stations. However, a variety of types and accuracy of tasks solved by the above devices and systems, requires metrological studies of the presence of different sets of reference standards of different lengths [3].

II. CONCLUSION

To summarize, the following can be noted. The “basis” was first called the distance between two points, then a system of points in two-dimensional space today - is the construction of points in space. Spatial reference geodetic bases occupy an important place in geodetic calibration practice and play a large role in verification of modern serial geodetic instruments. The development of scientific and technological progress provides great potential for improving created, developing new verification methods at the modern level, taking into account the latest serial geodetic instruments.

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