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EVALUATION OF PRACTICAL APPLICATION OF RADIOPHYSICAL APPROACH FOR GEOPHYSICAL FIELDS PARAMETERS MEASUREMENT

Abstract

Radiophysical approach for geophysical fields measurement is based on measurement of electric emission frequency variation under external fields effect. Until now this approach was implemented only in Gravika software and hardware complex experimental prototype in the framework of STCU project No.3856. However, the launch of the ACES module to the ISS is scheduled to take place in 2013 with the purpose to conduct a number of experiments, intended for improvement of Galileo European Navigation System characteristics. Also in the framework of this program it is intended to perform an experiment to measure emission frequency variation from the ISS to the Earth surface under gravity acceleration. This experiment can be defined as radiophysical gravimeter. The geophysical gravity-oriented microsatellite project, consisting of two modules connected by the solar battery, representing a pantograph with solar energy to electric energy converters, is also of interest. Use of the geostationary communications satellite for retransmission, Lybid national communications satellite in particular, will allow to implement the Earth's gravitational field radiophisical measurement approach and to become a part of EGNOS navigation system, as well. Also making of the autonomous radiophisical gravimeter on the basis of optical frequency standards, stability of which now amounts to 10-17 – 10-18, seems to be promising. This gravimeter will have the size of a cube with height not more than 1 m. Thus, use of radiophisical approach allows to expand navigation systems functional capabilities, as well as to make an essentially new radiophisical gravimeter, capable of tri-axial gravity acceleration measurement in any environments at any transportation means.