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SCIENTIFIC PROGRAM AND OPERATION OF SMALL SATELLITES "AIST".

Abstract

In 2013 two small satellites of "AIST" series were launched into an orbit. This is the first joint project of Samara State Aerospace University (SSAU) and Space-Rocket Center (SRC) "Progress". There are some educational, scientific and technological experiments, which are carried out by this project: - ensuring flight capacity of advanced multifunctional non-hermetic platform for spacecraft weighing 30 to 60 kg; - geomagnetic field measurement and methods of small spacecraft microacceleration measurement and compensation ("MAGCOM" equipment); - research into problems of microgravity; - research into natural and artificial high-velocity mechanical particles behavior ("METEOR" equipment); - perfection of "way cargo" satellite launch technology and shock-free undocking of small satellite from carrier spacecraft; - creation of amateur bandwidth communication links to provide a channel for multiagent technologies information exchange; - outer-space experimental tests of perspective gallium arsenide solar batteries. The microsatellite platform was produced by SRC "Progress" and research equipment of small satellites "AIST" the "MAGCOM" and "METEOR" were developed by Institute of spacecraft instrument engineering of SSAU. The research data from the satellites is received and processed by both SRC "Progress" researchers and the SSAU young researchers in "Samara" Earth remote sensing data acquisition, processing and distribution center. Since 2006, over 100 students took part in the "AIST" program, most of them after graduation were employed at research institutions or high-technology manufacturing enterprises. Over the period, more than 50 specialists' graduate projects and over 20 bachelors' graduate papers were completed, 9 MS and 5 Candidate of sciences degrees were obtained on the basis of the project. The constellation of "AIST" series satellites is the cosmic segment of SSAU's educational and research laboratory, which not only forms the basis for fundamental and applied research projects, but also ensures education and training of highly qualified professionals who are competent in real-life design, improvement and operation of spacecraft. In this paper the operational information and the results of scientific experiments of small satellites "AIST" are given.