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MISSION OF SAMSAT-ION FOR STUDY OF GEOPHYSICAL FIELDS: CONCEPT AND  
REALIZATION**Abstract**

The study of geophysical fields (ionosphere, magnetosphere) is one of the main directions in the use of nanosatellites. To date, many similar scientific missions have been implemented and are planned for implementation in the world. The report describes the mission of SamSat-ION nanosatellite produced by Samara National Research University. The scientific equipment of the nanosatellite includes a plasma parameter sensor, a magnetometer on an external rod, a two-frequency navigation receiver of GLONASS signals for scientific purposes. The resonant type plasma parameter sensor is designed to measure the concentration and fluctuations of the ionospheric plasma while moving in orbit. The sensitive element of the sensor is placed outside the nanosatellite on a folding rod. The dual-frequency navigation receiver makes it possible to measure the total electronic content from the propagation delays of the radio signal from the navigation satellite. An original organization of experiments on monitoring the upper ionosphere is proposed. When creating the nanosatellite, a number of new technical solutions were used to achieve and maintain the required orientation by choosing the parameters of the nanosatellite at the design stage. The onboard angular motion control loop allows refinement of the parameters of the onboard model of the angular motion, including the satellite inertia tensor, by processing the accumulated sample of measurements of the nanosatellite motion dynamics. An original system for opening external structural elements has been developed, using a locking device made of Rose alloy, which melts at a temperature of 92-98 degrees. An increased radiation resistance of the nanosatellite was achieved through the use of protective screens and special coatings. The piggy back launch of the SamSat-ION nanosatellite is scheduled for May 2023 in a sun-synchronous orbit.