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PROGRAM OF IONOSPHERIC RESEARCHES OF UKRAINIAN MICROSAT SATELLITE

Abstract

The National Space Program of Ukraine till the year 2020 includes the realization of the Ionosat multi-satellite scientific mission which is planned to include three satellites at coordinated low Earth orbits. Its main goal is a multi-point global monitoring of dynamical processes in the ionosphere – study of the ionospheric disturbances created by the influences "from above" (from the Sun and open space) and "from below" (caused by natural and man-made high-energy impacts, such as earthquakes, hurricanes, explosions, starts of heavy rockets etc.). The Ionosat-Micro mission will be realized as the first stage of the Ionosat mission – the forerunner project scheduled for launch onboard the Ukrainian Microsat satellite with the aim to test the Ionosat mission scientific postulates and to collect related space data. The Microsat satellite is planned to launch on SSO 668 km. The main goal of the Ionosat-Micro mission is the study of following formations in the ionosphere: • Space-temporal structure and global distribution of inhomogeneities in neutral atmosphere and ionosphere; • Global structure and dynamics of quasi-stationary electric currents, electric and magnetic fields; • Wave structures and turbulences at different spatial and temporal scales. Space measurements will be supported by synchronous experiments with ground support facilities – both active and passive ones. To realize such a research, the scientific payload of Microsat satellite provides measuring the following parameters: • Neutral gas and plasma parameters - concentrations, temperatures; • Vectors of DC-ELF-VLF electromagnetic fields and ELF-VLF plasma current fluctuations (waveforms); • Total electron content; • Full spectrum of plasma waves. As a result of realization of the Ionosat-Micro mission onboard the Ukrainian Microsat satellite, the Ionosat mission principles of designing and concept of functioning will be determined.