SPACE EDUCATION AND OUTREACH SYMPOSIUM (E1)
Innovative and Informal Space Education (4)

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UTILIZATION OF STATE-OF-THE-ART INFORMATION TECHNOLOGIES FOR TRACKING OF SCIENTIFIC - EDUCATIONAL PROJECTS IN SPACE (BY THE EXAMPLE OF "FOTON-M2/3" MISSIONS)

Abstract

For increase of educational effect, strengthening of interest to space researches on the part of youth it is necessary to develop special information resources, permitting to approach the users located on the Earth to that occurs in space. There are a lot of research experiments in space devoted to development of a science about behavior of substance in space conditions with the purpose of creation of the theoretical bases of space production in microgravitation. The purpose of the developed scientific-educational technology is creation on the Earth on the base of telemetry data of virtual motion model of the space vehicle and virtual model of microgravitational environment in which experiments are carried out. The first version of such scientific-educational technology has been tested during microgravitational space platform (MSP)"Foton-M2" mission (June, 2005). Within the framework of this educational project it was realized the constant simulation and prediction of MSP motion and microgravitational parameters onboard directly in flight time with representation of this information by the users via INTERNET. For determination of motion parameters were used information from the navigation receiver and magnetometer, included in the student equipment "MIRAGE" placed on MSP board. The information from MSP was transmitted to the Earth on a telemetry channel and was handled in the special program unit. Data about the full MSP state vector, adduced to one moment of times, further acted in the motion simulation unit of "Virtual Foton" where they were used in the capacity of initial entry conditions at integration of the motion differential equations system. Besides it, microacceleration levels were calculated in various points of the bay of scientific equipment caused both MSP dynamics and an aerodynamic braking. In the unit of visualization the information processing acting from the simulation unit and its representation in visual and user-friendly sort was made. This unit was built into the INTERNET site created specially for support of the given program. Users through the INTERNET network could access on the given site, entering the password and coordinates of allocation of the experimental gear in connected coordinate system and to gain access to the information on microacceleration levels on MSP board in a required point. This technology was used for tracking youth experiments on "Foton-M3" in 2007 too.