SPACE EDUCATION AND OUTREACH SYMPOSIUM (E1)
New Worlds - Innovative Space Education and Outreach (7)

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SPACE EXPERIMENT "SHADOW-BEACON" ON INTERNATIONAL SPACE STATION FOR EDUCATIONAL PURPOSES

Abstract

Use of space flights for stimulation of public interest to an advanced science and techniques and also for the educational purposes is the common and successful practice. Museums of astronautics are usually quite popular. Pupils of many schools chosen in turn with great interest take part in radio meetings with astronauts onboard ISS. The considerable interest is shown also to creation of students' and radio amateur satellites. The Long-term scientific Program for the Russian Segment of the ISS includes space experiment (SpEx) "Shadow-beacon" with a board amateur radio , one of which purposes is use of its methodology in the educational practice. While performing this SpEx in the chosen geographical region the available onboard radio beacon transmits VHF sounding signals of 145 MHz range containing time marks. The task of every individual participant is to receive these signals and register moments of its appearance and following signal vanish using the time marks and to address this information along with data on geographical position of the receiver to the Information Storing Center. Every operating sequence would take up to 20 min. while ISS is passing over the given continental measuring field. Collection of these data and knowledge of instant mutual position of the ISS and each receiver allows to define the basic properties of a "multibeam" method of radio sounding of undersatellite space. Exclusive simplicity of such method of radio sounding allows to carrying out SpEx "Shadow-beacon" with invitation of nonprofessional operators - radio amateurs, and also to provide use of this SpEx for school-educational programs. Certainly, for carrying out of such laboratory routine an educational institution needs to have got a collective amateur radio station and to make the coordination of learning process with the current flight task of ISS crew. The repeater mode of the probing signal generation was successfully used while performing a few sessions of SpEx "Shadow-beacon" in the period of 2011-2913 years with participation more than 100 ground operators including pupils, particularly there were tried out a scenario of laboratory routine for students and a new form of out-of-school work with pupils based on the methodology of SpEx "Shadow-beacon". It is planned that program of this space experiment will be completely fulfilled within 2013-2014 years.