

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

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CURRENT RESULTS OF SPACE EXPERIMENT "SHADOW-BEACON" ON INTERNATIONAL  
SPACE STATION: SCIENTIFIC AND EDUCATIONAL ISSUES

**Abstract**

Use of space flights for stimulation of public interest to advanced science and techniques and also for the educational purposes is the general 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. Long-term Program of Science and Applications Research and Experiments Planned for the Russian Segment of the ISS includes space experiment (SpEx) "Shadow-beacon", which methodology may be used both for scientific and educational purposes because it's exclusive simplicity. While performing this SpEx the available onboard radio beacon transmits VHF sounding signals of 145 MHz range. The task of every individual participant is to register moments of signal appearance and following signal vanish and to address this information to the Information Storing Centre. Every operating sequence would take up to 20 minutes, while ISS is passing over the given continental measuring field. Here presented are general results of six series of SpEx "Shadow-beacon" sessions performed during 2008 - 2013 years in a digipeater mode with the participation of about 70 ground operators. The scientific goal of SpEx is observation of experimental borders of ISS footprint i.e. "illuminated" spot on the Earth surface and evaluation of basic properties of a "multibeam" method of radio sounding of undersatellite space. The main scientific issue of SpEx is an demonstration that these basic properties of a "multibeam" radio sounding practically do not depend on non-equal sensitivity of ground receivers and on conditions of VHF signals propagation in undersatellite space. The main educational result of SpEx is creation and in orbit demonstration of scenario of laboratory works for students. Perspectives to perform World Wide lesson using the SpEx "Shadow-beacon" procedure are briefly discussed. It should be expected that the expansion of laboratory room to the orbital heights, the interaction of ground operators in the course of lab-activity with real orbital object would stimulate additional interest of students or pupils to the educational process.