**Detection of extremely high-energy cosmic rays and neutrinos by radio astronomical methods**

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**Abstract**

The possibilities of the ground based radio telescopes to detect the radio pulses arising when the extremely high-energy cosmic rays (and neutrinos, too) interact with the lunar regolith are considered. This radio astronomical method of the EHE cosmic rays detection, based on Askarian's effect, was proposed by the end of 1980s. The main idea of the technique is to use the lunar regolith as a giant target and the radio telescopes as the detectors of the coherent Cherenkov nanosecond radio pulses from the cascades with the negative charge excess.

During more than quarter of a century a number of such lunar experiments were carried out mainly in 1-3 GHz frequency range using the large radio telescopes of Australia, USA, Russia and of other countries. All these experiments put only the upper limits to the EHE cosmic rays and neutrino fluxes. For this reason, it will be the great interest to search for nanosecond radio pulses from the Moon at lower frequencies with the future giant radio telescope SKA (Square Kilometer Array) constructed in Australia and in South Africa.

On the basis of a standard software package GEANT4 and of some original research the new calculations were made of the pulses from the cascades with the charge excess induced by particles with extremely high energies in the lunar regolith. The possibility to detect of the pulses using one of the most sensitive meter-wavelength large phased array BSA FIAN as well as the prototype of the wide field of view meter-wavelength array of Pushchino Radio Astronomy Observatory is considered.

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