

A project of the OLVE-HERO space detector is proposed for CR measurement in the range 10^{12} - 10^{16} eV, which will include a large ionization-neutron 3D calorimeter with a high granularity and geometric factor of $\sim 16 \text{ m}^2 \cdot \text{sr}$. Current OLVE-HERO main detector is expected to be an image calorimeter of a boron loading of plastic scintillator with a tungsten absorber. Such a calorimeter allows one to measure an additional neutron signal which will improve the energy resolution of the detector and mainly the rejection power between electromagnetic and nuclear CR components will be increased by factor 30-50. The OLVE-HERO boron-loaded prototype detector was designed and tested at SPS CERN during Pb ion run in 2018. Results of the OLVE-HERO toy Monte-Carlo simulation are presented.

The preliminary results of the simple OLVE-HERO detector simulation are presented. Using a boron-loaded scintillator as a detector and neutron moderator leads to delayed signals from the neutron capture of boron-10 after the primary interaction of the CR particle. The first significant calculations have been done, which make it possible to estimate the sensitivity of the detector in a real configuration for CR in the region of 10^{14} - 10^{16} eV with taking into account the background of produced α -particles.

The density of the CR flux in the orbit of the Earth satellite with energy of $E > 1 \text{ GeV/n}$ is $\sim 1.2 \cdot 10^8 / \text{cm}^2 \cdot \text{sr} \cdot \text{year}$. This flux will generate evaporation and then thermalized neutrons. Thus, inside the detector the equilibrium density of thermal neutrons is established, which determines the value of the constant background signal in the boron-loaded scintillator, which can "score" the signal from the CR showers, so there is a fear that the detector will "go blind" or give incorrect results. To obtain the final answer, it is necessary to carry out additional tests on the beams and simulation of this effect, taking into account the spectrum and composition of the CRs, as well as the geometry of the detector. Those further works are in progress.