

Solar gamma-ray and neutron registration capabilities of the GRIS instrument onboard the International Space Station

Friday, 14 October 2016 16:15 (15)

GRIS (Gamma and Roentgen radiation of the Sun) is a prospective hard X-ray and gamma-ray spectrometer of solar flares with the energy range from 50 keV to 200 MeV. It is also designed for registration of high energy neutron fluxes (>30 MeV). The apparatus will be mounted on an oriented platform outside the Russian Orbital Segment of the International Space Station. The instrument includes two detector heads: a low energy spectrometer (LES) based on a fast scintillator with relatively high energy resolution 3.5–4.5% at 662 keV (LaBr₃(Ce) or CeBr₃) and size of $\varnothing 7.62 \times 7.62$ cm, and a high energy spectrometer (HES) based on $\varnothing 12 \times 15$ cm CsI(Tl) scintillator. Thanks to n/ γ discrimination capability of CsI(Tl) crystals, the HES spectrometer is also intended for neutron registration. To estimate GRIS instrument registration capabilities, simulation of the HES neutron and gamma registration channels response to background radiation and to solar flares of different magnitude and spectral compositions was performed. Expected spectral and n/ γ discrimination performances based on measurements with detectors prototypes are represented.

Primary author(s) : Mr. TROFIMOV, Yury (National Research Nuclear University MEPhI)

Co-author(s) : Dr. GLYANENKO, Alexander (National Nuclear Research University “MEPhI”); Mr. LUPAR, Evgeny (National Research Nuclear University MEPhI); FARADZHAEV, Rodion (National Research Nuclear University MEPhI); Dr. YUROV, Vitaly (National Research Nuclear University MEPhI); Dr. KOTOV, Yury (National Research Nuclear University MEPhI)

Presenter(s) : Mr. TROFIMOV, Yury (National Research Nuclear University MEPhI)

Session Classification : Methods of experimental physics - parallel VII

Track Classification : Methods of experimental physics