

Performances investigation and material selection of PMT magnetic shields for the space experiments with GRIS and PING-M instruments

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Scintillation detectors based on Hamamatsu photomultiplier tubes (PMTs) R6233-100 and R6231-100 with diameter of photocathode 76 mm and 51 mm respectively are used in GRIS experiment, which is planned to be installed onboard the ISS, and in PING-M for Interhelioprobe mission. PMT performances significantly change under the influence of a magnetic field. Even the relatively weak geomagnetic field, which typically value is about 0.5 gauss, has an appreciable effect. PMT gain variations with photocathode diameter 76 mm may reach 10-20 % depending on spatial orientation. Therefore, it is necessary to apply magnetic shields for PMT response stability enhancement. The performances investigation of magnetic shields made of steel, permalloy and amorphous metallic alloy ribbon was carried out. Influence of the shield position relative to the PMT photocathode was studied. Based on obtained data the choice of magnetic shield was made.

Presentation type

Section talk (10+5 min)

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