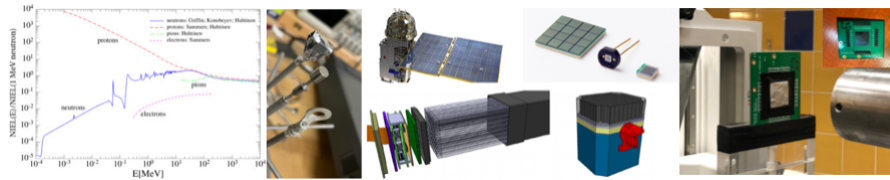


SiPM Radiation: Quantifying Light for Nuclear, Space and Medical Instruments under Harsh Radiation Conditions



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SiPMs proton irradiation for POLAR-2

Tuesday 26 April 2022 11:00 (25 minutes)

POLAR-2 is a polarimeter built to investigate the polarization of gamma-ray bursts in a cosmic space. The instrument will be launch in 2024 on board of the China Space Station and is therefore subject to background radiation from cosmic rays and solar flares. Contrary to its predecessor POLAR, where the scintillators were read-out using a multi-anode PMT, the plastic scintillators will be read-out by four 16 channel Silicon Photo-Multiplier (SiPM).

During my presentation I will show the results of the proton irradiation of SiPM arrays by mono-energetic 58 MeV protons. In our work, two types of silicon photodetectors from Hamamatsu: S13361 and S14161 are tested. The changes in the SiPM current-voltage characteristics, dark count rate and dark count spectrum before and after irradiation in temperatures in the range of 25 C deg. to -20 C deg. for different doses (up to 7 Gy) will be presented. The results of proton activation analysis will be shown at the end.

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