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Radiation hardness of semiconductor avalanche detectors for calorimeters in future HEP experiments.

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During last years, semiconductor avalanche detectors are being widely used as the replacement for classical PMTs in calorimeters for many HEP experiments. In this report, basic selection criteria for replacement of PMTs by APDs and specific problems in the investigation of detectors radiation hardness are discussed. The design and performance of the hadron calorimeters developed for the future high energy nuclear physics experiments at FAIR, NICA, and CERN are discussed. The Projectile Spectator Detector (PSD) for the CBM experiment at the future FAIR facility, the Forward Calorimeter for the NA61 experiment at CERN and the Multi Purpose Detector at the future NICA facility are reviewed. Moreover, new methods of data analysis and results interpretation for radiation experiments are described. Specific problems of development of detectors control systems and possibilities of reliability improvement of multi-channel detectors systems are shortly overviewed. All experimental material is based on the investigation of SiPM and MPPC at the neutron source in NPI Rez.

Presentation type

Section talk (10+5 min)

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