

High Voltage Monolithic Active Pixel Sensors for High Energy Electron Beam Compton Polarimetry

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Precision polarimetry for high energy electron beams is a crucial aspect of the precision physics experiments that are either under construction or planned at facilities such as Jefferson Lab, the EIC (electron-ion collider), or the proposed upgrade for SuperKEKB polarized beam. Compton polarimetry can be implemented as a non-invasive continuous measurement. The technique is well known and has been used to make the highest precision polarimetry measurements to date 1% during the Jefferson Lab QWeak experiment. In this talk we report on our design and prototyping progress, for a Compton electron detector, proposed for the Jefferson Lab MOLLER experiment, the SuperKEKB polarized beam upgrade and as a possible technology for the future EIC. The detectors will use high voltage monolithic active pixel sensors, operated under vacuum and actively cooled. We will report on the current prototype development status, including the implementation of the carrier PCB, and the cooling design.

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