

Researches of irradiation-resistant LGAD detector for ATLAS HGTD

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Low-Gain Avalanche Detector (LGAD) with time resolution better than 50ps has been chosen as the sensors for HGTD project. The most important requirement of sensors for the project is radiation hardness, the sensor should collect more than 4fC charges and reach less than 50ps timing resolution at voltage (safe voltage for SEB) lower than 550V after irradiation ($2.5 \times 10^{15} \text{ neq/cm}^2$). IHEP has developed the carbon enriched LGAD sensors, which show good radiation hardness. This talk will show the researches of IHEP irradiation-resistant LGAD for ATLAS HGTD, including the sensors' properties before and after TID, neutron and proton irradiation. The beam testing results of pre-production sensors and sensors with ASIC will also be discussed.

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