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Evaluation of Characteristics of Hamamatsu Low-Gain Avalanche Detectors

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Low-gain avalanche detectors (LGADs) are attracted for fast response for realizing a 4D tracker in future experiment and for possible other applications. We have fabricated LGAD diodes and strip sensors and evaluated their characteristics including such as response to LEDs with various wavelengths/infrared laser, radiation hardness to proton and neutron irradiations. We noticed that a substantial gain is obtained in the interstrip region after irradiation whereas the gain was unity before irradiation. The gain was found reduced in the doped region. The radiation-induced gain variation is discussed from TCAD simulations.

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