

Timing performance and gain analysis of heavily irradiated LGAD diodes

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Using 120GeV pions at CERN SPS, the timing resolution and gain performance of heavily irradiated LGAD single pad diodes is evaluated. Samples were irradiated with thermal neutrons at JSI with fluences varying from $1e15$ neq/cm² to $6e15$ neq/cm². Single irradiated PIN samples were also included and presented for comparison. The voltage and temperature dependence of sample performance is presented while through use of two different amplifiers, the signal over noise ratio is evaluated for each setup. Two quartz coupled SiPMs were used as timing reference while sample leakage current was monitored for both samples and SiPMs.

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