

Study Radiation Hardness Performance of PiN diodes for the ATLAS Pixel Detector at SLHC

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We study the radiation hardness of PiN diodes which are part of the optical link. These components were irradiated by 200 MeV protons up to 8.2×10^{15} 1-MeV neq/cm² (84 MRad). The responsivity of PiN diodes are measured as a function of the radiation dose to estimate life time reliability of diodes.

Summary

We discuss the radiation tolerance of the silicon and GaAs PiN diodes that will be part of the readout system of the ATLAS upgraded pixel detector. The components were irradiated by 200 MeV protons up to 1.2×10^{15} p/cm² for 2.6×10^{15} p/cm² for 24 GeV protons. We study the radiation hardness of PiNs as a function of the optical sensitive area and of their cut off frequency. The dark current of PiN diode candidates is measured before and after irradiation, and the response of the PiN diodes was monitored online and some of them off-line as a function of the radiation dose.

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