

Effect of proton irradiation on the performance of 4H-SiC LGAD devices

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4H-SiC detectors have potential to operate in high radiation and room-temperature environments due to the broader band gap, elevated atomic displacement threshold energy and high thermal conductivity. In order to verify the irradiation resistance of 4H-SiC LGAD devices, we successfully prepared LGAD devices with a gain factor of 3 and proceeded to irradiate the device with protons at 80 MeV ($2 \times 10^{11} \text{ neq/cm}^2 \sim 1 \times 10^{14} \text{ neq/cm}^2$). Based on the defects identified in the 4H-SiC LGAD, the current-voltage, capacitance-voltage and gain factor of the devices were characterized and simulated before and after irradiation. In terms of the performance of leakage current and charge collection after radiation, 4H-SiC exhibits good radiation resistance, and the physical explanation can be given by simulation.

Type of presentation (in-person/online)

in-person presentation

Type of presentation (I. scientific results or II. project proposal)

I. Presentation on scientific results

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