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Study of Irradiation-Induced Defects in EPI silicon PINs and LGADs by c/iDLTS

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Low Gain Avalanche Detectors (LGADs) exhibit excellent properties, including ultra-fast time resolution and a high signal-to-noise ratio. They are widely used in high-energy physics experiments for precise particle detection and time-of-flight measurements. However, irradiation introduces deep-level defects and causes detector performance degradation. Therefore, improving the radiation hardness of LGADs is essential. In this work, capacitance-transient deep-level transient spectroscopy (c-DLTS) and current-transient deep-level transient spectroscopy (i-DLTS) were employed to investigate PINs and LGADs after various proton irradiation fluences up to 8e14 Neq/cm2. The defects of LGAD was observed by c/iDLTS method which has different defects energy level compared with PIN. We will show the tested defects of PIN and LGAD after 1e13 Neq/cm2 proton irradiation. And we will also show the defects of LGAD with different carbon dose after 8e14 proton irradiation.

Type of presentation (in-person/online)

online presentation (zoom)

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

I. Presentation on scientific results

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