

Research on graphene-optimized silicon carbide detector

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Silicon carbide as wide band-gap semiconductor, has physical characteristics of wide bandgap, excellent carrier mobility, higher breakdown electric field, higher thermal conductivity and higher saturated drift velocity compared with silicon. However, the existing 4H-SiC radiation detectors all use metal electrodes, which are easy to produce structural defects after metal electrode irradiation, thus seriously reducing the mechanical and physical properties of the material. Therefore, the application of silicon carbide detector in the field of nuclear detection and heavy ion detector is limited. Graphene has the advantages of zero band-gap, high carrier mobility, high conductivity and anti-irradiation, which provides a new idea for demetallization of particle detector electrodes. A graphene-optimized silicon carbide detector was developed and its electrical properties and charge collection properties were studied. The experimental results predict that the graphene-optimized silicon carbide detector can improve the charge collection speed and time resolution of the detector.

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

II. Presentation on project proposal

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