Evaluation of GaN in Application for Radiation Detection

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Semiconductors enable the direct conversion of X-rays into electrical signals, improving spatial resolution and signal response speed, compared to scintillators. Today, the high-Z material CdTe is widely used in state-of-the-art medical imaging due to its strong X-ray absorption. Compared to CdTe, GaN offers lower absorption in high-energy X-ray; however, the low internal fluorescence yield and the low Compton scattering effect of GaN X-ray detectors could suppress secondary interactions. In addition, GaN as a wide bandgap semiconductor offers high breakdown field and chemical stability. In this talk, we discuss the possibilities and the challenges of GaN in application for X-ray detectors.

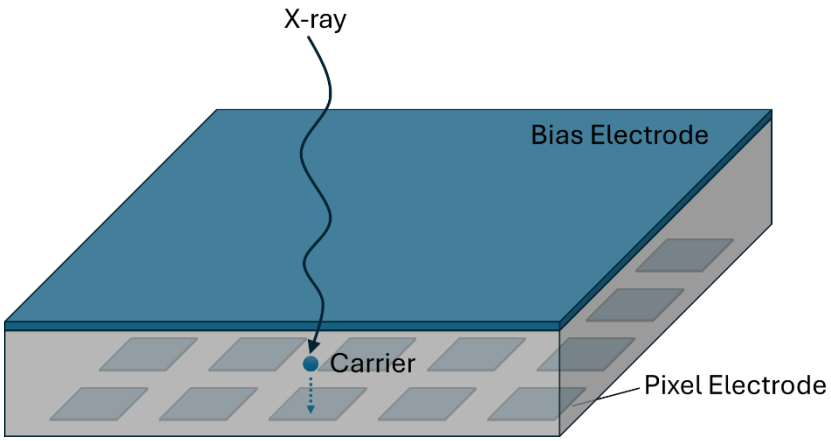

Figure Structure of a direct-conversion X-ray detector