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Potential of Thin Films for use in Charged Particle Tracking Detectors

Thin Film technology has widespread applications in everyday electronics, notably Liquid Crystal Display screens, solar cells, and organic light emitting diodes. We explore the potential of this technology as charged particle radiation tracking detectors for use in High Energy Physics experiments such as those at the Large Hadron Collider or the Relativistic Heavy Ion Collider. Through modern fabrication techniques, a host of semiconductor materials other than silicon are available to construct thin, flexible detectors with integrated electronics with pixel sizes on the order of a few microns. We review the material properties of promising candidates, discuss the potential benefits and challenges associated with this technology, and review previously demonstrated applicability as a neutron detector.

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