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## Development of a HPGe Detector for Ultra High Rate Spectroscopy and Imaging

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A prototype High Purity Germanium (HPGe) detector has been designed to maintain energy resolution and throughput performance at count rates in excess of 2 Mcps while providing fine 3D position sensitivity. Conventional HPGe detectors show significant degradation in performance at such count rates, limiting their use in applications including imaging for nuclear medicine, nuclear decommissioning and remediation, and the assay of spent nuclear fuel. The detector design, a double-sided strip detector with a strip pitch of 0.5 mm, was selected by performing analytical and numerical calculations of the expected efficiency, throughput, timing, energy resolution, and position resolution for various geometries and electrode configurations. Details of the design and predicted performance will be shown. Results from the fabrication and characterization of the prototype will be presented.

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