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Electrically-cooled HPGe detector for advanced x-ray spectroscopy and imaging

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This paper describes a novel High Purity Germanium (HPGe) detector, specifically designed to address the challenges of ultimate x-ray spectroscopy and imaging applications for synchrotrons.

It consists of a multichannel HPGe crystal (monolithic or individual elements) providing new and ultimate X-ray energy resolution level especially at high count rates (reaching 190eV at 6keV and 0.1µs shaping time), and high throughput.

The crystals are cooled using a state-of-the-art electrical cryocooler with active vibration cancellation. The use of a cryocooler does not have any negative impact on the detector performance.

Keywords

HPGe, XAFS, X-ray Spectroscopy, Electrical Cryocooler, Germanium detector

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