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Single-Sided Charge-Sharing CZT Strip Detectors for Gamma Ray Astronomy BURCIN DONMEZ, JAMES RYAN, JOHN MACRI, MARK MCCONNELL, University of New Hampshire, TOMOHIKO NARITA, College of the Holy Cross, LOUIS-ANDRE HAMEL, University of Montreal — We report progress in the study of thick single-sided charge-sharing cadmium zinc telluride (CZT) strip detector modules designed to perform gamma-ray spectroscopy and 3-D imaging. We report laboratory and simulation measurements of prototype detectors with 11×11 unit cells ($15\times15\times7.5\text{mm}^3$). We report measurements of the 3-D spatial resolution. Our studies are aimed at developing compact, efficient, detector modules for 0.05 to 1 MeV gamma measurements while minimizing the number and complexity of the electronic readout channels. This is particularly important in space-based coded aperture and Compton telescope instruments that require large area, large volume detector arrays. Such arrays will be required for the NASA's Black Hole Finder Probe (BHFP) and Advanced Compton Telescope (ACT). This design requires an anode pattern with contacts whose dimensions and spacing are roughly the size of the ionization charge cloud. The first prototype devices have 125μm anode contacts on 225μm pitch. Our studies conclude that finer pitch contacts will be required to improve imaging efficiency.

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