The Development of a Position-Sensitive CZT Detector with Orthogonal Co-Planar Anode Strips

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We report on the simulation, construction and performance of prototype CZT imaging detectors employing orthogonal coplanar anode strips. These detectors employ a novel electrode geometry with non-collecting anode strips in one dimension and collecting anode pixels, interconnected in rows, in the orthogonal direction. These detectors retain the spectroscopic and detection efficiency advantages of single carrier (electrons) charge sensing devices as well as the principal advantage of conventional strip detectors with orthogonal anode and cathode strips, i.e. an N x N array of imaging pixels are realized with only 2N electronic channels. Charge signals induced on the various electrodes of a prototype detector with 8 x 8 unit cells (1 x 1 x 5 mm^3) are compared with the simulations. Results of position and energy resolution measurements are presented and discussed.