

Development of radiation detectors with high Z material

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The recent progress of CdTe and CdZnTe crystals and the availability of interconnection technology open the possibility of processing CdTe detectors with small pixels down to 55 μm in combination with high efficiency for X-ray energies above 20 keV. Hybrid systems with the state of the art readout electronic these assemblies open new possibilities for medical imaging.

At the Freiburger Materialforschungszentrum CdTe, CdZnTe and GaAs detectors have been studied for several years. These studies include the crystal growth, material characterization and processing of radiation detectors. In the last years the technology for hybridization of CdTe and GaAs based pixel detectors was developed for small pixel pitches. Different types of pixel detectors have been produced using our own technology with small pixels down to 55 μm and high connection density up to 65,000 pixels. Detectors with a size of 14x14 mm^2 and 42x28 mm^2 were developed using the Medipix2 and recently Medipix3 electronics.

The talk will give an overview about the status of high-Z detector materials and related detector technology. The performance of Medipix2 and Medipix3 assemblies will be presented regarding the efficiency, the homogeneity and the spectroscopic performance.