

## Coded Mask Imaging with CZT Detectors

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Coded mask imagers based on CZT detectors are under consideration for future high energy X-ray astronomy missions. UCSD and WU have developed a prototype crossed strip CZT detector that operates from  $\sim 10 - 300$  keV with 500 micron spatial resolution and few keV energy resolution. This was combined with a MURA coded mask to form a laboratory coded mask imager, in which the detector resolution oversampled the mask unit cell by a factor of 2.6. Images were made with 41 keV X-rays to study the detector's spatial accuracy and the system's modulation transfer, sensitivity, image accuracy, and systematic effects. Results were excellent. The detector exhibited high spatial accuracy and strip-to-strip (and pixel-to-pixel) selectivity, and the modulation transfer was essentially 100 percent. Correlation images showed a strong peak,  $76 \sigma$ , due to the X-ray source, which had a width and shape in agreement with expectations. The off-source image was flat and had fluctuations that were agreement with counting statistics. Any systematic effects were limited to less than 0.5 percent of the source. These results were obtained without any "flat fielding" corrections, such as irregularities in detector spatial accuracy or effective area. In light of these result, coded mask imagers based on CZT detectors should be able to provide high quality images with large dynamic range, as will be necessary for future deep surveys of the high energy X-ray sky.