

**Experiment title:**

Evaluation of a silicon detector for photon counting energy sensitive computed tomography: effect of high flux on energy resolution

**Experiment number:**  
MI 1009

**Beamline:**  
BM05

**Date of experiment:**

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**Shifts:**  
12

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**Report:**

The success of the experiment was mitigated by sample problems. Unforeseen disturbances between the analog and digital part of the ASIC made the detector pick up unexplicable noise. ASICs for high flux photon counting are complicated; by systematic variation of detector settings (x-ray energy, intensity, and channels illuminated) we were able to hypothesize solutions to the problems. The lessons learned helped in redesigning the ASIC solving the problem.

Albeit no publications have emerged as a result of the measurements, a more thorough understanding of the workings of the detector was gained and a better design emerged. The current detector has successfully been used in a laboratory set up employing chromatic spectra at lower flux for capturing CT images of x-ray phantoms; similar sample problems are therefore not foreseen.