

Abstract Submitted
for the MAR15 Meeting of
The American Physical Society

A MEMS-based device used for alignment and manipulation of MLL x-ray focusing optics WEIHE XU, KENNETH LAUER, HUI YAN, Brookhaven Natl Lab, VELJKO MILLANOVIC, Mirrorcle Technologies, Inc. , EVGENY NAZARETSKI, Brookhaven Natl Lab, BROOKHAVEN NATL LAB TEAM, MIRRORCLE TECHNOLOGIES, INC. TEAM — Multilayer Laue lenses (MLLs) X-ray microscopy is a powerful tool used for materials research. To push the spatial resolution of x-ray microscopy studies below 10 nm the system needs to be compact and rigid. Applications of MEMS based tip-tilt stages used for alignment and manipulation of nanofocusing optics is a promising route to achieve high stability. In this work, we report characterization and stability testing of a MEMS device suitable for manipulation of nanofocusing optics. We developed two closed-loop circuits implemented in a MEMS tip-tilt device utilizing capacitive and laser interferometry techniques. Test results demonstrate better than 10 mille-degree resolution when using capacitive sensors and better than 0.8 mille-degree resolution when using interferometry sensing respectively.

Weihe Xu
Brookhaven Natl Lab

Date submitted: 14 Nov 2014

Electronic form version 1.4