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# Phase-contrast computed microtomography with 50 keV synchrotron x-rays

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The possibilities to determine the internal structure of low density materials by a simple microtomography setup with a synchrotron x-ray beam were investigated experimentally. We recorded phase-contrast images of a boron fiber with a high-resolution CCD-camera using the coherence properties of a 50 keV x-ray beam at a wiggler beamline ID 15. The fiber, which has negligible absorption in this energy range, was positioned at various distances up to 2 m from the camera. The contrast in the images is due to interference of the reference wave with the object wave in an in-line holographic setup.

With an intensity-only filtered backprojection algorithm we obtained the refractive index distribution of the fiber. In the reconstruction from 61 holographic images, taken over an angular range of 180 degrees, the hollow, 15 mm diameter core of the fiber is clearly visible.

To increase the image quality we plan to reconstruct for each angle the projected images digitally from the holograms, making use of the fact that the refractive index is purely imaginary for boron at 50 keV. These reconstructed 2d images will be put into a filtered backprojecting tomographic algorithm to achieve a 3d refractive index distribution of the fiber.