

Grating-based phase-contrast microtomography at PETRA III

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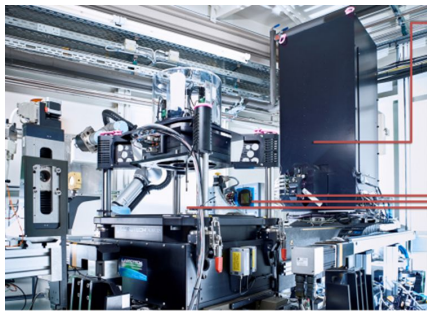
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The Helmholtz-Zentrum Geesthacht, Germany, is operating the user experiments for microtomography at the beamlines P05 and P07 using synchrotron radiation produced in the storage ring PETRA III at DESY, Hamburg, Germany. Attenuation-contrast and phase-contrast techniques were established to provide an imaging tool for applications in biology, medical science and materials science. Here we will present the current status of the grating-based phase-contrast setup including the development of a 20 MPixel high speed CMOS camera together with the optimisation of the used grating setup. Selected examples of user applications will be given.



Camera Tower equipped with two camera systems

- CCD-based for high precision / dynamic range; 3056 x 3056 pixels, 16-bit
- CMOS-based for fast data acquisition; 5120 x 3800 pixels, 12-bit

Fluorescence Screen + magnifying optics

100-300 μm CdWO₄ + 5x / 10x / 20x magnification

Phase Grating (additional analyzer grating possible)

10 μm pitch (standard), 4.8 μm for high resolution (≤ 35 keV) + double grating; gratings can be tilted in beam direction to adjust for specific energy

Two rotation axes (standing + hanging)

Variety of sample environments possible

small sample environments can easily be mounted

e.g. water tank, climatic chamber

Automatic sample changing system

for standard measurements without sample environment

Setup for grating-based phase-contrast microtomography installed at beamline P07 at the storage ring PETRA III / DESY, Germany.