

The new x-ray phase contrast endstation at TOMCAT

Wednesday, 18 September 2013 12:15 (2 hours)

Grating interferometry (GI) constitutes a recently established phase contrast x-ray imaging technique that provides a particular high sensitivity towards density variations in the sample. For this reason, GI is especially suitable for imaging subtle differences in soft tissues, which resulted in an ever increasing interest from the biomedical researchers. Until recently, the experimental implementation of GI at TOMCAT was shared with different setups.

Now, TOMCAT offers an endstation that is dedicated to phase-sensitive x-ray imaging with GI. The new setup offers significant advantages to the user community. First, the setup time is severely reduced allowing for a more effective use of beamtime. Second, the longer source to sample distance implies a high sensitivity and a larger the field of view. Third, the new design allows for more flexibility with respect to changing imaging parameters. In addition to the new experimental setup, the analysis pipeline was considerably optimized regarding reconstruction time (200s for a 2000x1000x1200 pixel data set) as well as artifact reduction.

We will show the significant improvements of imaging conditions as well as experimental examples from our users and collaborators such as visualising amyloid plaque deposition in the mouse brain, monitoring of tissue degradation in an artificial heart valve and imaging arteriosclerosis in mouse models.

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Session Classification: Poster session I and lunch