

Advances in X-ray Phase Tomography using a Grating Interferometer

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We report on significant advances and new results concerning the extension of a recently developed *radiographic* phase contrast imaging method to three-dimensional *tomographic* phase imaging. In the case of x-ray synchrotron applications, we demonstrate how the soft tissue sensitivity of the technique is increased and show in-vitro tomographic images with unprecedented quality and resolution of a tumor bearing rat brain sample, without use of contrast agents. In particular, we observe that the brain tumor and the white and gray brain matter structure in a rat's cerebellum are clearly resolved.

To show that the results are potentially interesting from a clinical point of view, we present experimental results, which demonstrate that a similar approach can be implemented with more readily available x-ray sources, such as standard x-ray tubes [1].

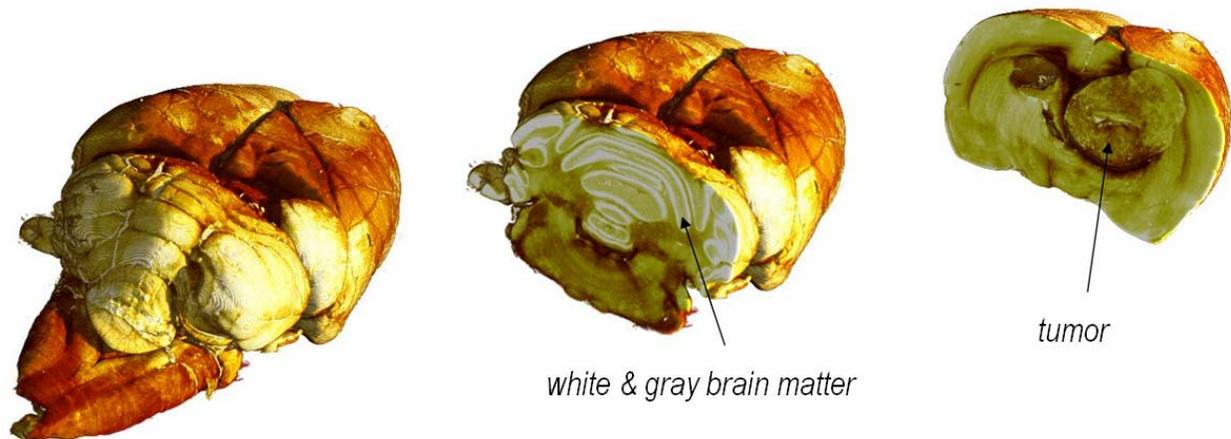


Figure: In-vitro X-ray phase-contrast tomography synchrotron results obtained on a rat brain fixed in formalin. Clearly visible is the white and gray brain matter in the region of the cerebellum and a tumor.

[1] F. Pfeiffer, O. Bunk, C. Kottler, and C. David, *Hard x-ray phase tomography with low-brilliance sources*, Phys. Rev. Lett., accepted (2007).

[2] F. Pfeiffer et al., in preparation.