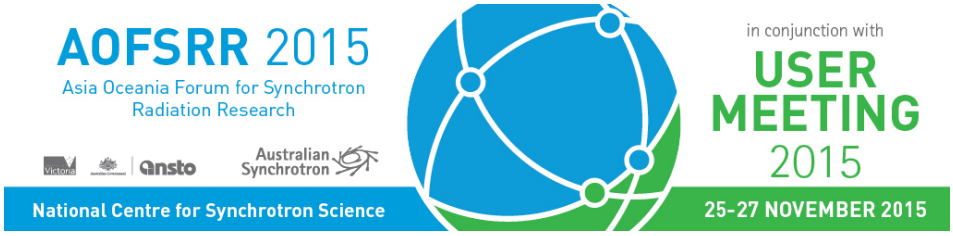

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Tomography at the Australian Synchrotron XFM beamline

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The X-ray Fluorescence Microscopy (XFM) beamline at the Australian Synchrotron is host to the Maia x-ray fluorescence detector, developed by CSIRO and BNL [1]. The Maia's large collection area and optimised photon event processing combine to achieve high sensitivity and photon count rates, enabling rapid, microscale mapping of trace metals in a variety of specimen types from biological to mineralogical [2].

High pixel rates can be used to measure large specimens at high definition or to exploit extra information using multi-scan techniques such as X-ray Fluorescence Computed Tomography (XFCT), resulting in elemental maps of 2d slices and / or 3d volumes. Recent upgrades to the Maia detector and scanning stages have led to dramatic improvement of beamline capability. Here we report on recent upgrades to the beamline, and outline a workflow that will enable rapid processing of elemental-specific tomographic data. We describe some of the benefits and disadvantages of measuring hydrated vs freeze-dried specimens.

A persistent desire to map low-Z elements (e.g., P & S, but also K & Ca) in larger specimens leads to the issue of self absorption [3]. We discuss local progress towards developing self-absorption corrections and their inclusion in the anticipated data pipeline.

[1] R Kirkham et al. AIP Conf. Proc. 1234, 240 (2010)
[2] CG Ryan et al., J. Phys.: Conf. Ser. 499, 012002 (2014)
[3] MD de Jonge, S Vogt, Curr. Op. in Struct. Biol. 20/5, 606 (2010)

Keywords

XFM, tomography, XFCT

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