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The Biomedical Beamlines at the Canadian Light Source –A Bit of History and Diffractive X-Ray Optics Development for Biomedical Application

Thursday 12 June 2025 16:30 (45 minutes)

The BioMedical Imaging and Therapy (BMIT) facility is comprised of two beamlines at the Canadian Light Source –one sourced by a superconducting wiggler (BMIT-ID) and a second with a bend magnet source (BMIT-BM). A bit of the history of the beamlines, capabilities and applications will be given. The bend magnet beamline, BMIT-BM, allows both filtered white beam access as well as monochromatic beam prepared by a double crystal monochromator. Access to the filtered white beam provides an opportunity to develop various x-ray optics using x-ray diffraction akin to an "x-ray wind tunnel". The diffracting elements are typically bent silicon wafers in the Laue or transmission geometry. Some of those optical developments will be presented along with principles of operation and applications including contrast element imaging, element speciation imaging, wide energy range imaging, vertical beam expansion and horizontal beam compression. The "beam expander", a two-bent-crystal device similar to a Galilean optical expander, can provide expansions up to a factor of 10 while mostly preserving the spatial coherence that enables in-line phase contrast imaging.

Keyword-1

Keyword-2

Keyword-3

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