

## Small Angle Scattering Beamline at the Australian Synchrotron

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The National Science case for the initial suite of beamlines at the 3.0 GeV Australian Synchrotron included a high performance SAXS/WAXS beamline [1]. This beamline will provide access to an intense and highly collimated x-ray beam using a 3 metre long in-vacuum undulator source, and a dedicated SAXS/WAXS endstation. The facility will support a very diverse range of research activities requiring structural information on solids and liquids over a size range of approximately 0.1 - 500 nm.

Intensive beamline design activities were undertaken during 2006 and the procurement of the photon delivery system is well advanced. The primary goal of beamline design was to allow measurement of scattered radiation as close as possible to the direct beam, through the use of an undulator source and by careful design of the photon delivery system. At the heart of the beamline is a set of KB mirrors which provide much of the collimation of the beam, rather than a conventional 3-slit system. Independent focusing in the horizontal and vertical planes provides a flexible beamline suited to a diverse range of SAXS/WAXS applications. The beamline has been designed to readily allow future incorporation of a double multilayer monochromator for experiments requiring extreme incident fluxes beyond  $10^{14}$  photons/second. The vertical focusing mirror will be bounce-down to provide a basic capability for liquid surface scattering.

The facility is designed to support time resolved experiments, anomalous scattering experiments, grazing incidence scattering, 2-D SAXS/WAXS mapping of samples, and wide angle scattering. The photon energy will be readily tunable over 5.5 20 keV. A range of camera lengths up to 8m will allow access to different ranges of scattering angles.

An outline of the basis of the design and the performance specifications of the beamline will be presented and some scientific applications discussed.

(1) See <http://www.synchrotron.vic.gov.au/files/documents/NSC-Full-version.pdf>