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Results from the high-brightness x-ray spectroscopy beamline at ALS for the 2 - 5 keV region

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Beamline 9.3.1 at the Advanced Light Source (ALS) is a windowless beamline, covering the 1-6 keV photon-energy range, designed to achieve the goal of high brightness at the sample for use in the X-ray Atomic and Molecular Spectroscopy (XAMS) science, surface and interface science, biology and x-ray optical development programs at ALS. A new "Cowan type" double-crystal monochromator, based on the boomerang design used at NSLS beamline X-24A, has been developed for beamline 9.3.1 at the ALS. The mechanical design has been simplified, and recent developments in technology have been included. Measured mechanical precision of the monochromator shows significant improvement over existing designs. Such precision is essential because of the high brightness of the ALS radiation and the overall length of beamline 9.3.1 (26 m). X-ray absorption and time of flight photo emission measurements in the 2 - 5 keV photon energy range along with the flux, resolution, spot size and stability of the beamline and the monochromator will be discussed. Prospects for future XAMS and material science measurements will also be presented.

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