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Elliptically polarized undulator beamlines at the Advanced Light Source

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Undulator beamlines at the Advanced Light Source (ALS) for the production and use of elliptically polarized x-rays are described. These beamlines, with multiple undulators and branchlines, will have a wide energy range, high throughput, and high resolution, making the facility ideal for applications in both microscopy and spectroscopy.

Undulators of the "APPLE 2" design first proposed by Sasaki are used. These devices produce x-rays with user-adjustable polarization, from linear to elliptical to circular. Using higher harmonics and undulators of 5.0 and 8.0 cm periods, a 20 eV to 1800 eV energy range is covered.

Two independent beamlines will be built. One beamline will be optimized for microscopy applications. It will have a moderate resolution, entrance slitless monochromator optimized for high throughput. End stations for both zone plate and full-field photo emission microscopy are planned. A second branchline will be optimized for spectroscopy. Equipped with a high resolution monochromator, it will provide coverage over the entire energy range of the undulators, allowing for spectroscopic studies of materials and biological systems.

The facility will be ready in early 1997. This work is funded by the U.S. Department of Energy.