IPAC'24 - 15th International Particle Accelerator Conference



Contribution ID: 730 Contribution code: TUPG38

Type: Poster Presentation

Design and construction progress of ALS-U

Tuesday, 21 May 2024 16:00 (2 hours)

The ALS-U project to upgrade the Advanced Light Source to a multi bend achromat lattice received CD-3 approval in 2022 marking the start of the construction phase for the Storage Ring. Construction of the accumulator under a prior CD-3A authorization is already well advanced. ALS-U promises to deliver diffraction limited performance in the soft x-ray range by lowering the horizontal emittance to about 70 pm rad resulting in two orders of magnitude brightness increase for soft x-rays compared to the current ALS. The design utilizes a nine bend achromat lattice, with reverse bending magnets and on-axis swap-out injection utilizing an accumulator ring. It is optimized to produce intense beams of soft x-rays, which offer spectroscopic contrast, nanometer-scale resolution, and broad temporal sensitivity. This paper presents the final design, prototype results as well as construction progress.

Footnotes

Funding Agency

This work was supported by the Director, Office of Science, Office of Basic Energy Sciences, of the U.S. Department of Energy under Contract No. DE-AC02-05CH11231.

Paper preparation format

LaTeX

Region represented

North America

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Session Classification: Tuesday Poster Session

Track Classification: MC2: Photon Sources and Electron Accelerators: MC2.A05 Synchrotron Radiation Facilities