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Design and construction progress of ALS-U

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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

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