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Beamline engineering progress and key equipment development at Hefei Advanced Light Facility (HALF)

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The Hefei Advanced Light Facility (HALF) is a diffraction-limited storage ring light source currently under construction. Its storage ring will operate at 2.2 GeV with a circumference of 479.86 m and a natural emittance of 86.3 pm·rad. Engineering design for the first phase, comprising 10 beamlines covering the vacuum ultraviolet (VUV) to medium-energy X-ray range, has been completed. Among these beamlines, eight utilize grating monochromators, one employs a double-crystal monochromator (DCM), and one incorporates both grating and crystal monochromators.

To address the unique advantages and challenges of diffraction-limited light sources—characterized by high coherence, high brightness, and high resolution—we have undertaken a series of key technology developments in beamline engineering. This paper presents the latest progress on beamline construction and the development of high-resolving-power plane grating monochromators (PGMs), DCMs, and mirror systems.

Footnotes

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Author: DU, Xuewei (National Synchrotron Radiation Laboratory; University of Science and Technology of China)

Co-authors: CHEN, Jie (National Synchrotron Radiation Laboratory; University of Science and Technology of China); WANG, Qiuping (National Synchrotron Radiation Laboratory; University of Science and Technology of China); WEI, Shen (National Synchrotron Radiation Laboratory; University of Science and Technology of China); JIANG, Shuaikang (University of Science and Technology of China); PENG, Yang (National Synchrotron Radiation Laboratory; University of Science and Technology of China); XU, Zhanglang; WANG, Zimeng (National Synchrotron Radiation Laboratory; University of Science and Technology of China)

Presenter: DU, Xuewei (National Synchrotron Radiation Laboratory; University of Science and Technology of China)

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