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Diagnosics beamline development for ALS-U

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The Advanced Light Source (ALS) at Lawrence Berkeley National Laboratory is currently undergoing an upgrade known as ALS-U. As part of this upgrade, the existing Triple-Bend Achromat (TBA) storage ring lattice is being replaced with a Multi-Bend Achromat (MBA) lattice, which allows for the tight focusing of electron beams to approximately 10 μm , reaching the diffraction limit in the soft x-ray region. However, accurately measuring the beam size in such a tightly focused beam presents a challenge. This paper presents a diagnostics beamline design for ALS-U that utilizes a 2-slit interferometer technique to achieve a sub-micron resolution for beam size measurement. The impact of beam jitter, optics vibration as well as the incoherent depth-of-field effect on the measurement are also discussed.

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Footnotes

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Yes

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