

DESIGN OF THE WISCONSIN FEL SEEDED SOFT X-RAY FEL UNDULATOR LINES

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Abstract

The seeded FEL performance of a number of Wisconsin FEL (WiFEL) undulator lines is described. The experimental design requirements include coverage of a broad wavelength range, rapid wavelength tuning, variable polarization, and variable pulse energy. The beam parameters allow experiments ranging from those requiring low peak power with high average spectral flux to those that need high peak power and short pulse lengths in the femtosecond range. The FELs must also be stable in timing, power, and energy while satisfying constraints on electron beam quality and fluctuations, undulator technologies, and seed laser capabilities. Modeling results are presented that illustrate the design performance over the full wavelength range of the facility.

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