

Abstract Submitted
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Controlling wiggler harmonic radiation to minimize FEL cavity mirror damage¹ S.L. HUANG, Y.K. WU, Duke University — Wigglers emit both fundamental and harmonic radiation. In UV-VUV oscillator FELs, harmonic radiation can cause serious damage to the downstream mirror of the FEL cavity. This work reports our studies of wiggler radiation loading on the FEL cavity mirror. A mechanism to control and reduce mirror damage using a set of controllable in-vacuum apertures is being developed for the Duke storage ring FELs. Two optical klystron FELs, one with a pair of horizontally polarized wigglers, the other with a pair of circularly polarized wigglers, will be studied in detail. We will report the effectiveness of the apertures in reducing the wiggler harmonic radiation loading on the FEL cavity mirror for both optical klystron FELs under various operation conditions and for different lasing wavelengths.

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