Mechanical Design of NSLS Mini-Gap Undulator (MGU)

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Abstract

The mechanical design considerations are discussed with respect to the currently installed X-13 and future X-29 MGU. Comparisons to the previous two generations of variable small-gap undulators in the NSLS X-ray ring are made and design improvements are noted. The design requirements and mechanical difficulties for holding, positioning, and driving the magnetic arrays are explored. The structural, thermal, and electrical considerations that influenced the design are then analyzed. The mechanical performance of the MGU currently installed at X-13 is examined, and future installations and enhancements are presented.

Keywords: undulator, in-vacuum, small-gap, magnet-arrays

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