Superconducting Wiggler Magnets and Cryogenic Systems Upgrades For The NSLS X-Ray Ring

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Abstract

A 6 pole, 6 Tesla superconducting wiggler magnet provides collimated, high intensity, high energy x-rays to the X -17 straight section of the x-ray ring at the National Synchrotron Light Source (NSLS). A semi-automated, closed-loop cryogenic cycle maintains this wiggler magnet at 4.2 ºK continuously for nearly ten months each year. A new 13 pole superconducting wiggler magnet with significantly better thermal efficiency capable of operating with three different modes has been built by Oxford Instruments of UK. It is intended to replace the existing wiggler unit. These two wigglers have two distinctly different cryogenic systems. A brief review of their design features and their cryogenic systems are described