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Overview

The Superconducting Magnet Division (SMD) has retained the key elements of the expertise used in the design, construction, and test of 1,740 magnets for RHIC. The high reliability of these magnets has been essential to the good performance of RHIC. Since the completion of RHIC, the SMD has built smaller numbers of novel magnets that have contributed to the extension of RHIC's physics capability. Magnets with coils in the form of helices have enabled the collisions of polarized proton beams. A recent increase in the luminosity of RHIC was made possible by the construction of precise solenoid magnets for the electron lens system. Presently, the SMD is enhancing a computer-driven coil winding facility that allows multilayer coils with complex windings to be built. Such coils are needed to meet the demands of the magnets that will focus the eRHIC electron and ion beams at the point where they collide.

The SMD has made significant contributions to other accelerators. At BNL, the SMD recently deployed its expertise in the precise measurement of the magnets for NSLS II. The SMD built 20 magnets for the LHC at CERN, using a design that closely followed that of the RHIC dipoles. Presently, the SMD is working with Fermilab and Lawrence Berkeley lab to build magnets for the high-luminosity upgrade of the LHC. Magnets have been made at the computer-driven winding facility for accelerators in Germany (2), Japan (2), China, and an experiment at CERN. Recently, the SMD gained important experience in the construction of high-field magnets made with high temperature superconductor for energy storage to smooth out the fluctuations in wind and solar power. The SMD is now building a similar magnet for a physics experiment that will search for fundamental particles.

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