

Magnet Division Recent/Current/Future Projects

Projects completed in the last year:

- 20 10m dipoles for LHC IR, NbTi Rutherford cable, 4 different models, based on RHIC arc dipoles
- 2 IR magnets for upgrade of Beijing electron-positron collider BEPC, NbTi round cable, direct-wind, multielement (including solenoid)
- Magnet for ALPHA anti-hydrogen experiment at CERN
- Final-focus quadrupole and two other model magnets for International Linear Collider (ILC)
- 1m model fast-pulse dipole for FAIR project at GSI (Darmstadt), NbTi Rutherford cable and magnet structure modified to reduce ramp-rate effects
- 1 1m common coil dipole, react-and-wind Nb₃Sn Rutherford cable, 10T
- 0.3m common coil dipole, wind-and-react Nb₃Sn Rutherford cable, 12T, part of LARP (LHC Accelerator Research Program) R&D
- 0.3m mirror model quadrupole for RIA fragmentation quadrupole, superferric, high temperature superconductor (HTS), tape form

Projects underway (including FY07 work with funding levels not yet set):

- LHC Accelerator Research Program (LARP):
 - 2 4m common coil dipoles, wind-and-react Nb₃Sn Rutherford cable, a long version of the LARP magnet described above
 - Supervision of Nb₃Sn conductor procurement and qualification program
 - (Steve Peggs, Head of LARP, is a member of the Magnet Division staff)
- International Linear Collider (ILC) R&D:
 - Model final focus quadrupole QD0 with additional layers
 - 2m prototype QD0 Design and construction of cryostat for all seven IR magnets for ILC wide-angle IR
 - Vibration measurement and control for QD0
 - Work with detector groups (antisolenoid), DID
- 0.3m model quadrupole for RIA (finish 2nd half of mirror quad described above)

- 1m model common coil dipole wound using HTS Rutherford cable
- 3 0.3m corrector dipoles for proton transport line to J-PARC neutrino facility, NbTi round cable, direct wind
- NSLS II: Magnet design (both superconducting and resistive), engineering for CDR (funded through FY06)
- Magnetic field measurements of magnets for demonstration Energy Recovery Linac (ERL) ring, part of R&D for RHIC II (electron cooling upgrade)
- HTS solenoid for electron gun, for RHIC II
- Resonant power supply (30 Hz) for prototype dipoles for Rapid Cycling Medical Synchrotron (RCMS)
- Magnetic field measuring system for RCMS.
- Operate RHIC spare quadrupole on test stand at high ramp rates for axion experiment being carried out by BNL Physics Department. Work includes consultation on electrical noise and grounding.
- Commission LEGGS superconducting magnet, electrical and cryogenic performance, for BNL Physics Department.

Future projects (under discussion)

- NSLS II, magnet design and engineering, including HTS coil for dipole for VUV ring
- Direct wind:
 - Magnet for ATRAP antihydrogen experiment at CERN
 - Beamline sextupole for ASACUSA antihydrogen experiment at CERN
 - IR magnets for upgrade of Italian electron-positron collider Dafne