

Test Results of HD2, a High Field Nb₃Sn Dipole with a 36 mm Bore

The Superconducting Magnet Program at Lawrence Berkeley National Laboratory (LBNL) has developed the 1 m long Nb₃Sn dipole magnet HD2. With tilted (flared) ends to avoid obstructing a 36 mm clear bore, HD2 represents a step towards the use of block-type coils in high-field accelerator magnets. The coil design has been optimized to minimize geometric harmonics and reduce the conductor peak field in the end region, resulting in an expected short sample dipole field of 15 T. The support structure is composed by an external aluminum shell pre-tensioned with pressurized bladders and interference keys, and by two stainless steel end plates compressing the coil ends through four aluminum axial rods. We report on magnet design, assembly, and test results, including training performance, quench locations, and strain gauge measurements.