

## BaBaR Experiment Thin Solenoid



MAGNETS  
FOR FUSION



MAGNETS FOR HIGH  
ENERGY PHYSICS



MAGNETS FOR  
MEDICAL  
APPLICATIONS



SYSTEMS  
FOR ENERGY



SERVICES & REPAIRS

The 1.5 T thin superconducting solenoid (peak field 2.3 T in the conductor), completed in 1998, is part of the BaBar detector, located on the PEP-II B-Factory machine at the Stanford Linear Accelerator Center (USA).

The solenoid measures 3.38 m at the inner bore diameter, 3.7 m in length. The coil, 1067 turns of Al stabilised NbTi conductor, is wound on two layers inside an Al mandrel. The winding is axially graded to produce the requested  $\pm 3\%$  field uniformity in the tracking region; the stored energy is 27 MJ, the inductance 2.57 H and the operating current 4596 A.

The coil has been isolated with multiple layers of glass cloth, impregnated in epoxy resin using the VPI process. The coil is indirectly cooled at an operating temperature of 4.5 K using the thermo-siphon technique. The liquid helium is circulated in channels welded to the Al mandrel.



### Main parameters

Maximum field	1.5 T
Stored energy	27 MJ
Inner Diameter	$\phi$ 3380 mm
Magnet Length	3700 mm
Inductance	2.5 H
Nominal current	4596 A
Conductor	NbTi - Al
coextruded	
Type of Winding	outer mandrel
Type of cooling	indirect