



# SM Series: Subscale Prototypes

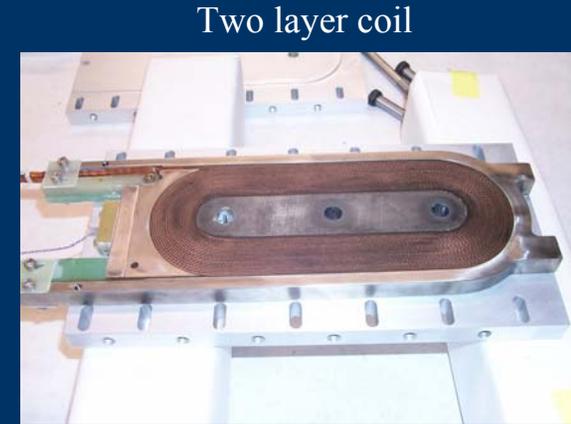
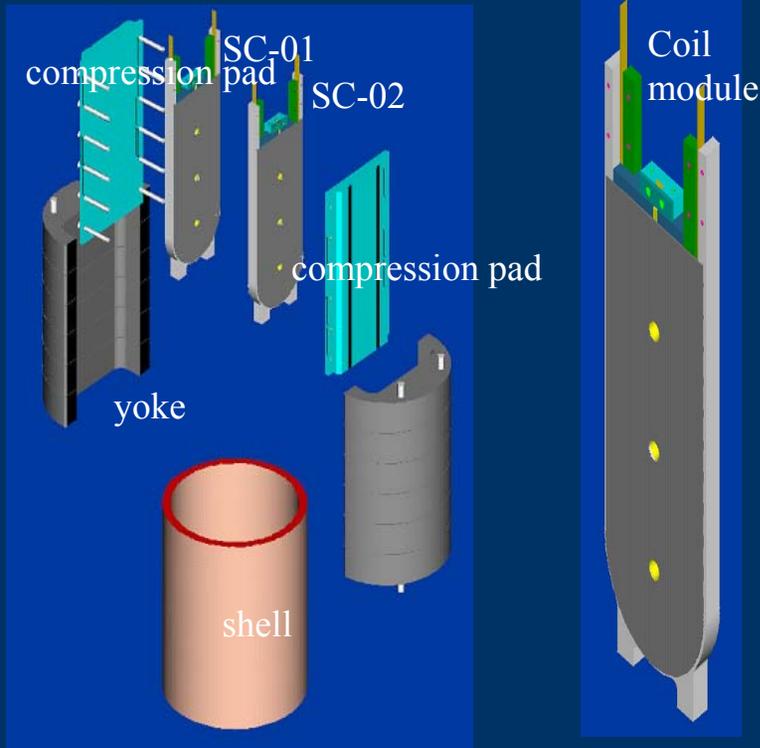
- Scaled version of main magnet
  - Approx. 1/3 scale
- Field range of 9 – 12 Tesla
- Two-layer racetrack coils
  - 5 kg of material per coil
- Streamlined test facility
  - Small dewar
  - Basic instrumentation



*First mechanical test demonstrated bladder & key assembly for RD3*



# SM Magnet Features



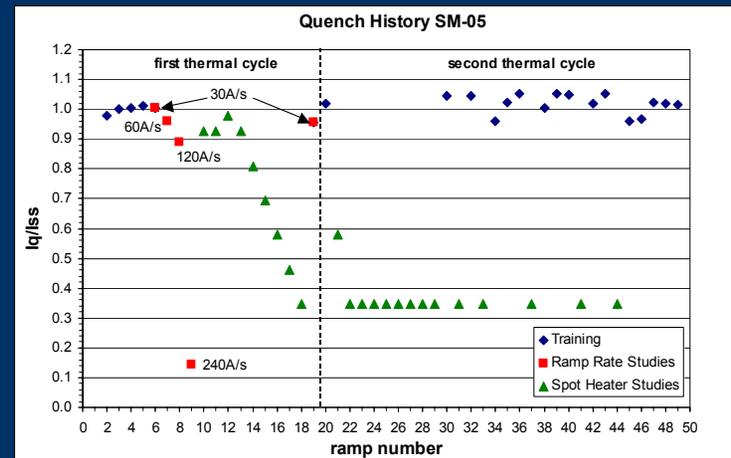
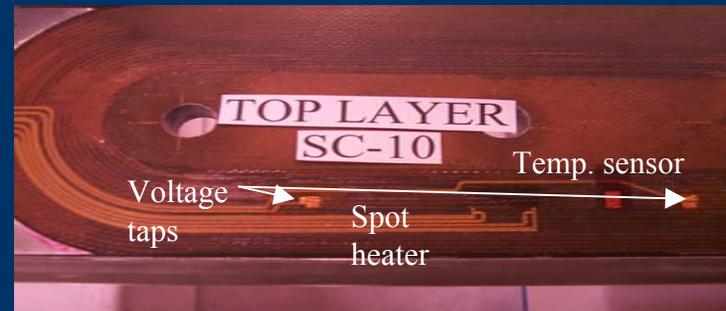
Modular, reusable components



# SM Prototypes 2002-2003

- SM-02 (July 2002)
  - Mixed-strand
  - Low quench performance
- SM-03 (October 2002)
  - Mixed-strand
  - Better performance than SM-02
- SM-04 (October 2002)
  - CTD/FNAL Ceramic Insulation
  - Excellent performance
- SM-05 (March 2003) LBNL/FNAL
  - Stress/temperature limits
  - Excellent performance

## SM05 Test: peak temperature 600 K





# Sub-scale Coil Status

- SC-01,02 SM-01 (Background coils)
- SC-03 SM-02 (Mixed-strand)
- SC-04 Outer conductor, ready to test
- SC-05 Mixed-strand (mechanically poor cable)
- SC-06 SM-03 (Mixed-strand w/ss core)
- SC-07 Mixed-strand, ready for test
- SC-08 SM-04 (CTD insulation)
- SC-09 Cu-ss core, ready for test
- SC-10 SM-05 (Thermal shock)
- SC-11,12 Ex-situ
- SC-13,14 Training studies, reacted



# Near-term plans

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- Heat transfer studies for LARP
  - Subsidized by base program
- Sub-scale racetrack quad?
- Phase II training study