

# VLHC Magnet Program at BNL

W. B. Sampson

## MAGNET DEVELOPMENT

- John Cozzolino
- Arup Ghosh
- **Bill Sampson**
- Mike Harrison
- Peter Wanderer

## CONDUCTOR DEVELOPMENT

- Mas Suenaga

⇒ HTS 20-30 K BSCCO YBCO(Suenaga)

⇒ Common Coil Magnet Design (CCM) (Gupta)

➤ Mechanical Limitations of HTS

⇒ Hybrid Test Magnet

➤ NbTi Main Coils (SSC inner cable)

➤ Nb<sub>3</sub>Sn Ribbon Insert Coil (GE)

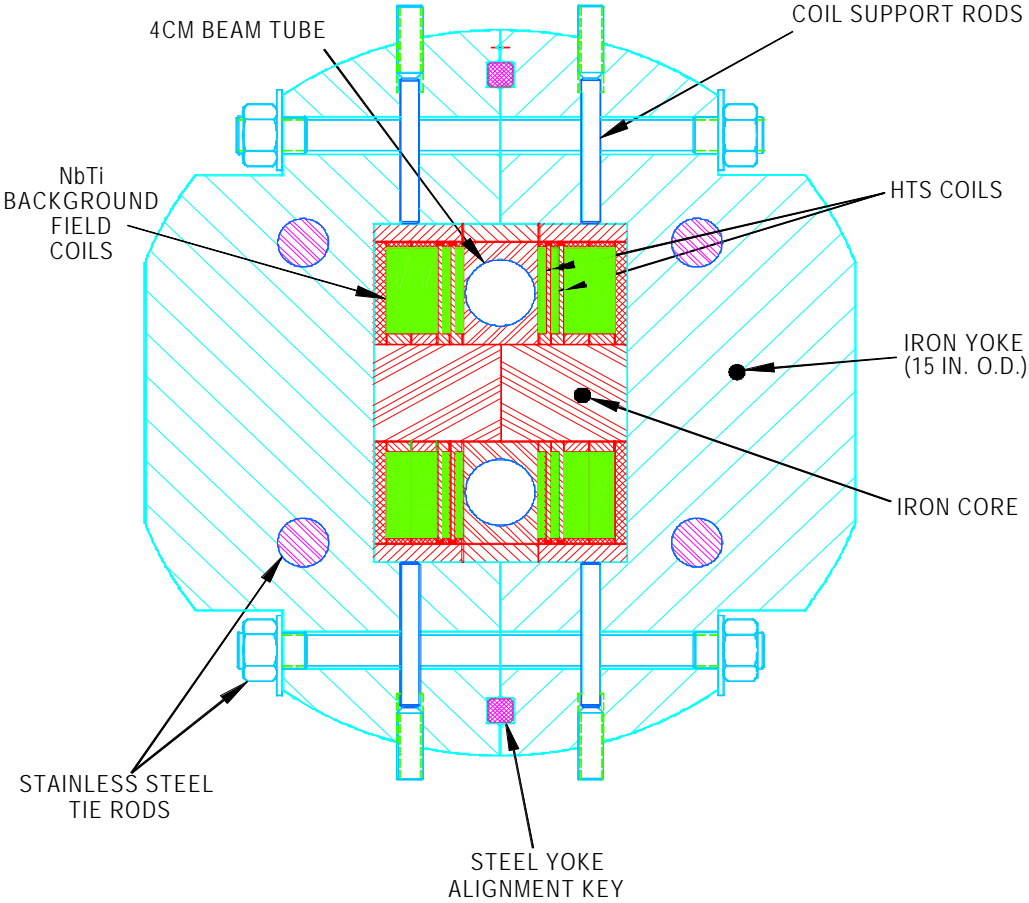
➤ HTS Tape Insert Coils (Bi-2223 IGC)

➤ 7T + ~1T from insert

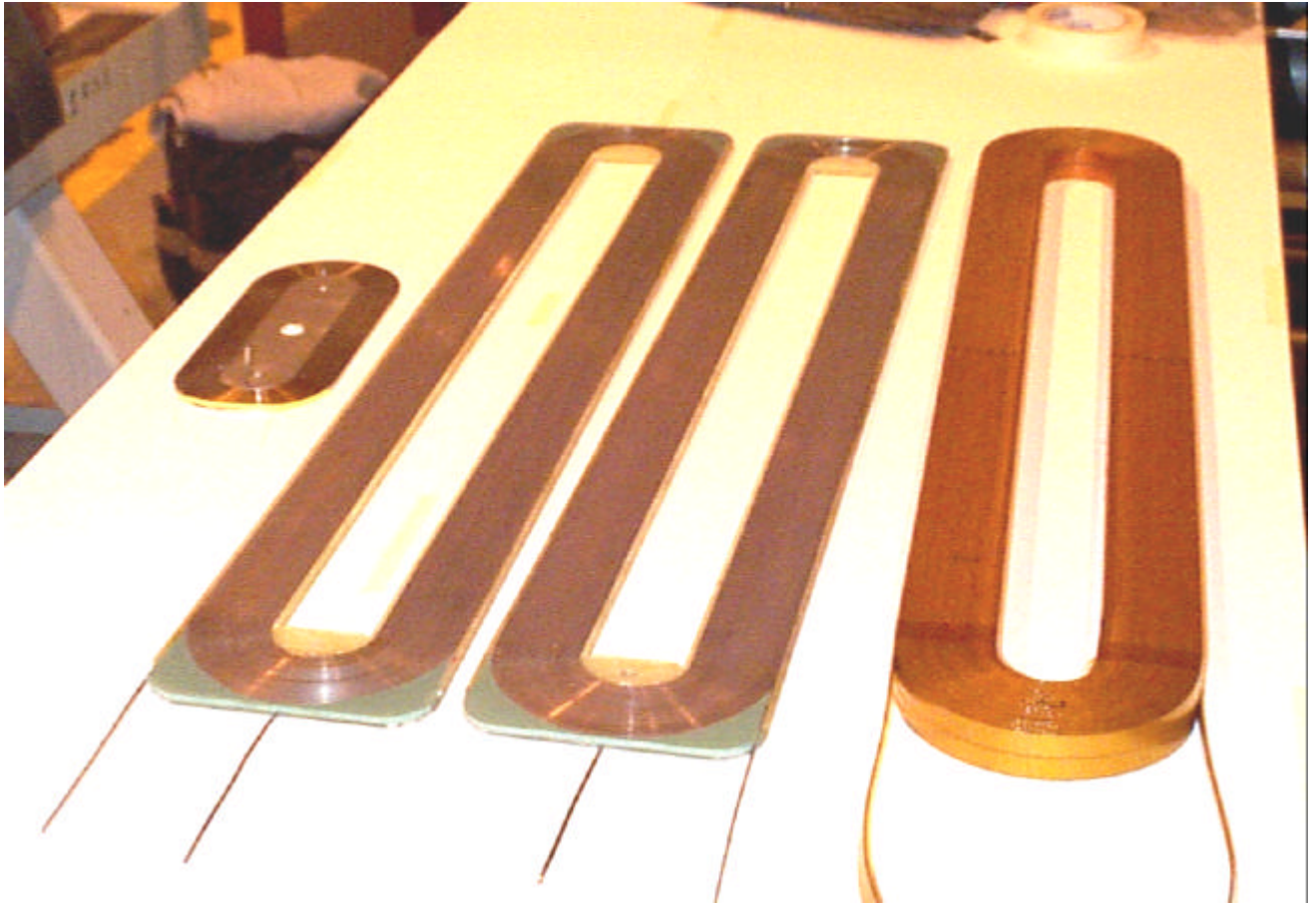
➤ Split Iron Yoke

➤ One meter long

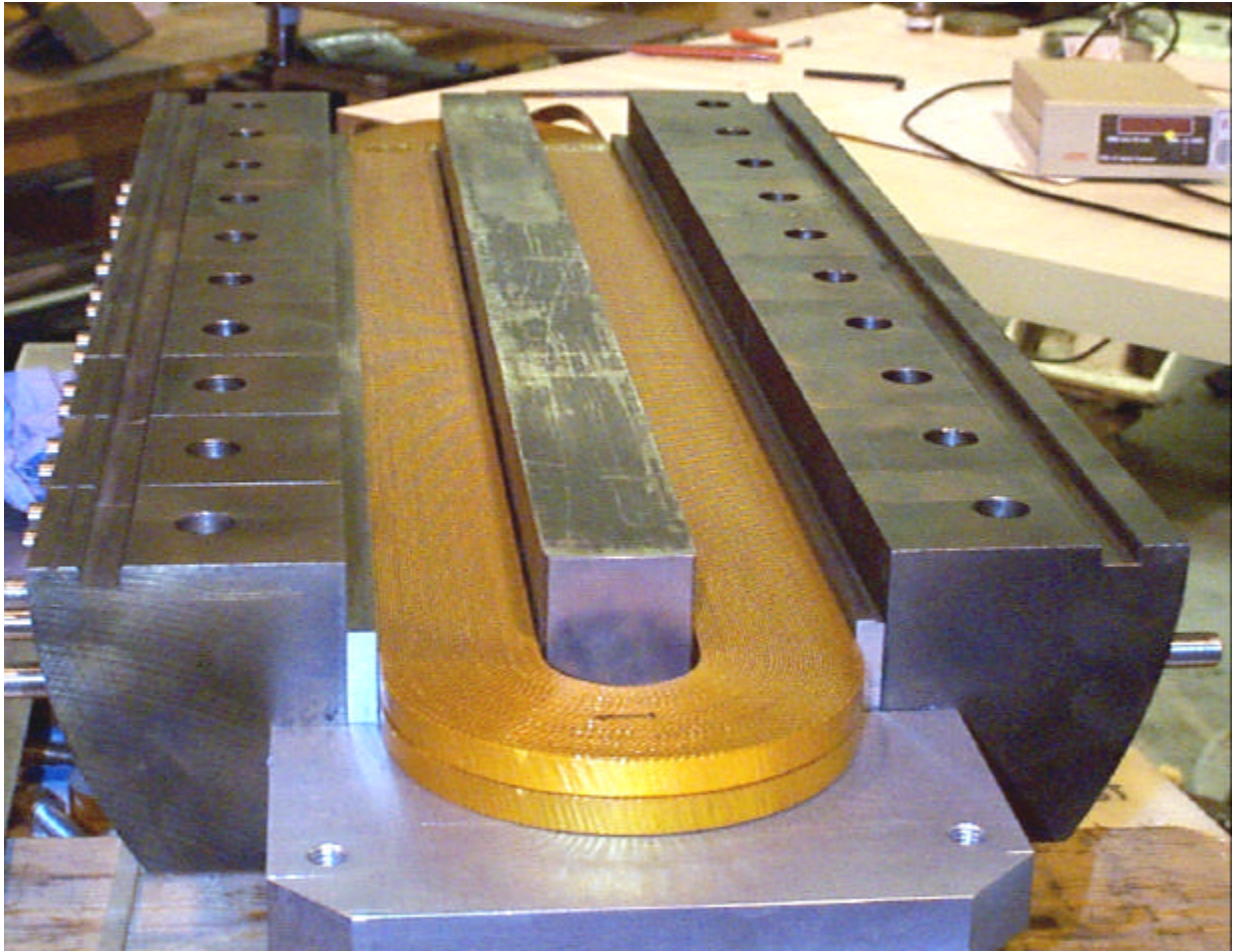
➤ Two 4cm Apertures



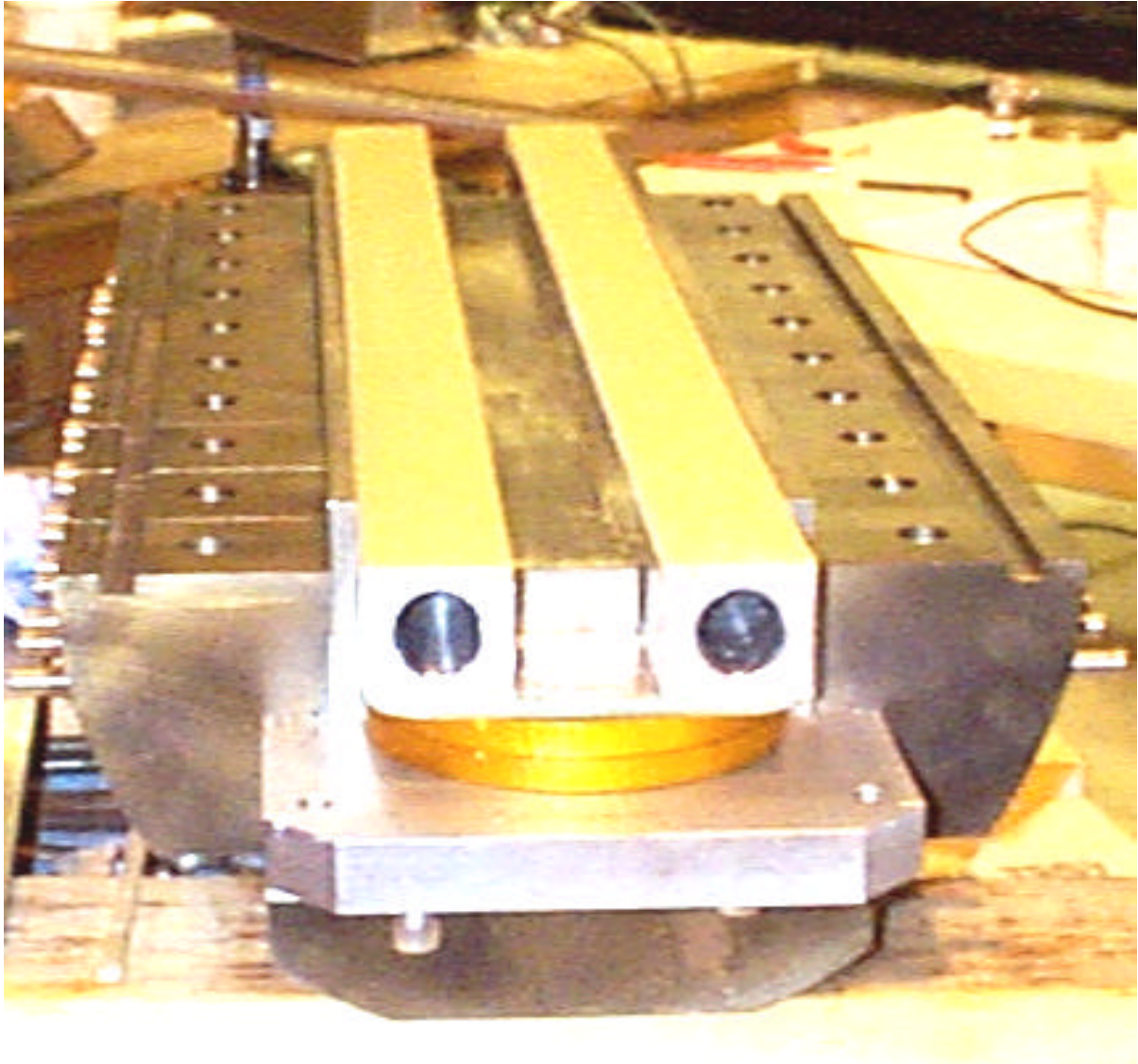
VLHC MAGNET WORKSHOP  
Nov 16-18 1998



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## CONDUCTOR TESTS

### Short Samples ( 3cm)

- Parallel and Perpendicular
- 4.2 K 8T (11T)
- B increasing and decreasing
- Bend and straighten
- IGC, OST, BICC, VAC, NST, Furukawa, Plastronics  
(EURUS)

### Small Racetrack Coils (15cm)

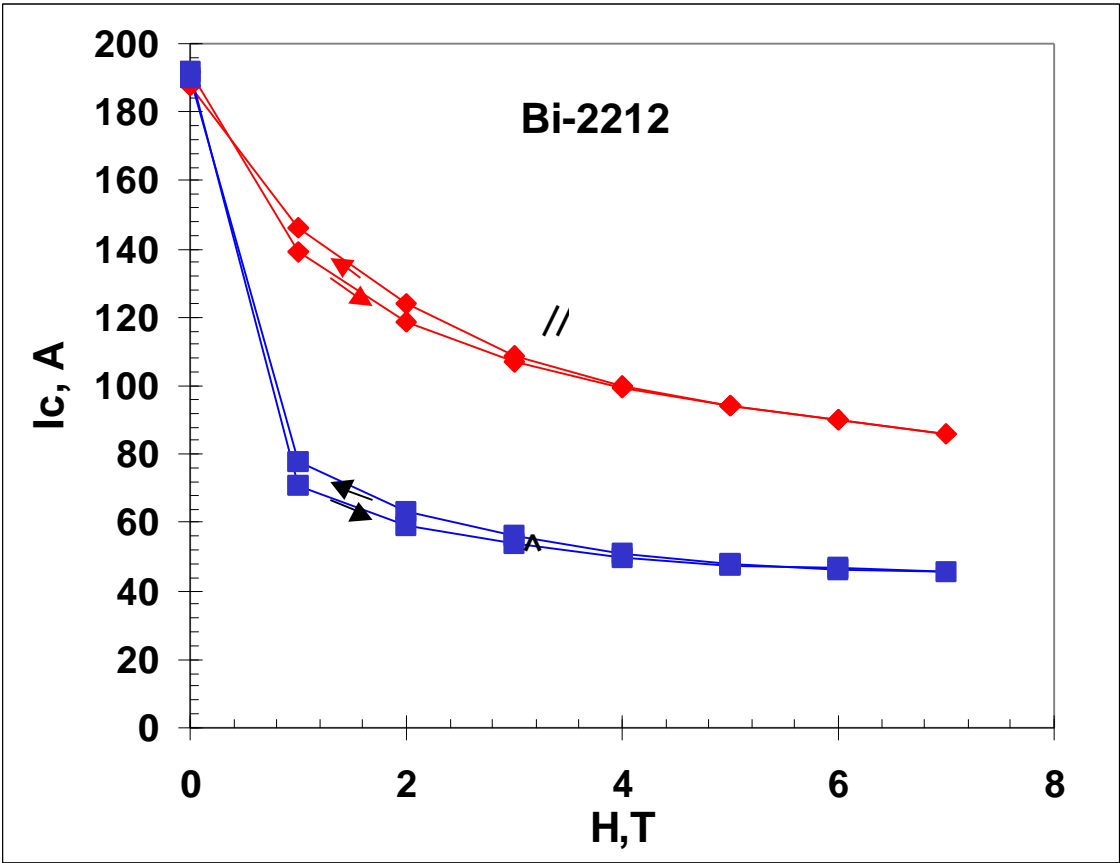
- IGC 2223
- OST 2212
- Nb<sub>3</sub>Sn (GE)

### Large Racetrack Coils

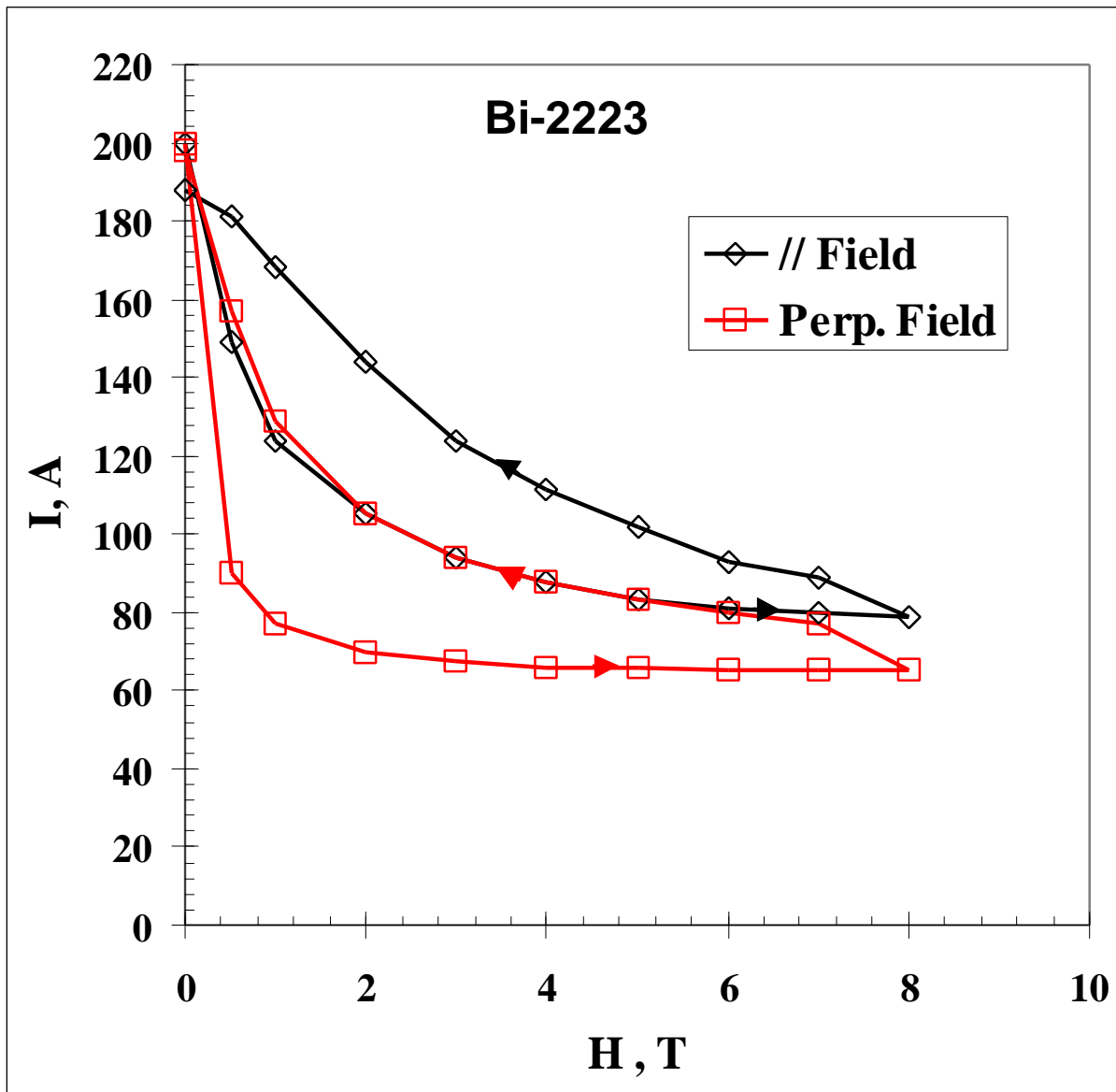
- Nb<sub>3</sub>Sn
- IGC Bi-2223

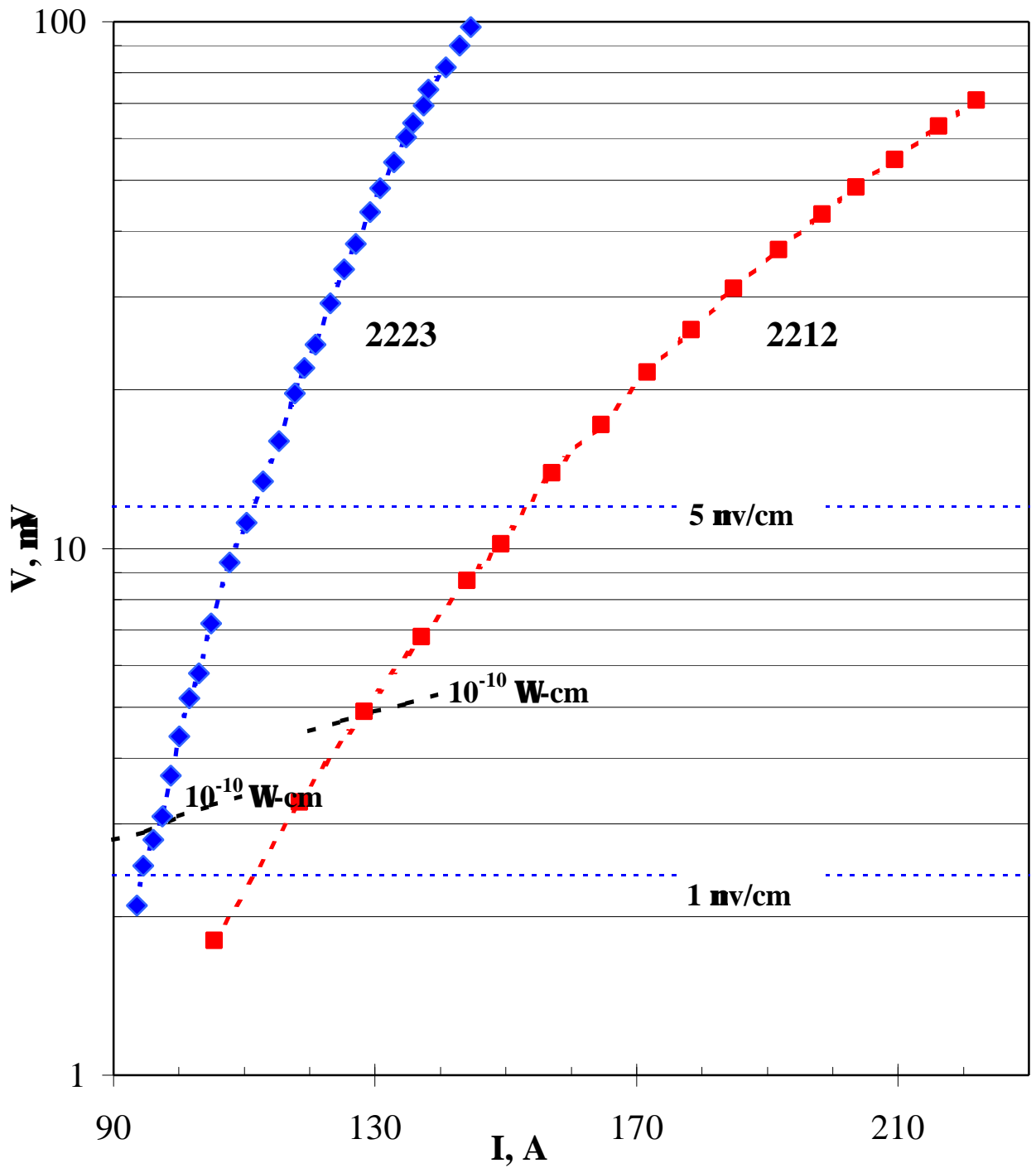
### HTS Pancake Coils @77K

- Tested on spool with Kapton insulation and removable Voltage taps

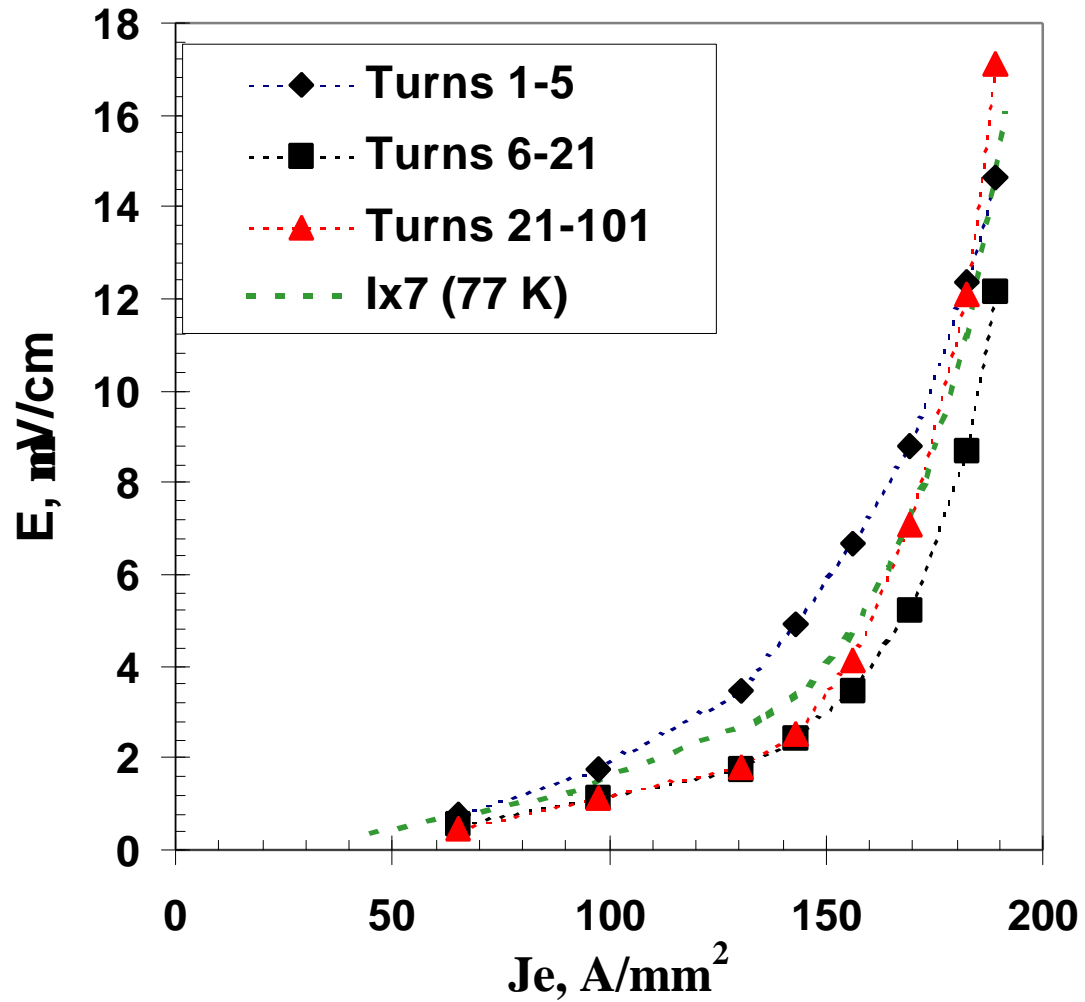








**V-I curve for Bi-2223 and Bi-2212 at 4.2K, 1.5T**



**Bi-2223 Coil**  
**Normalized electric field for different sections of the coil**

## CONCLUSIONS

- Experience with HTS and CCM
- Magnetic Measurements
- Quench protection studies
- Temperature Dependence
- Splices and Joints
- Multi-tape conductor (higher current)
- Refine design
- All HTS Magnet