

**MAGNETIC MEASUREMENTS
OF SSC 1 METER DIPOLES
DS0308 AND DS0309**

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TEST OBJECTIVES

I. ROOM TEMPERATURE

- COMPARE LAB 2 MEASUREMENTS WITH MOLE MEASUREMENTS IN IB1, FUNCTION OF LONGITUDINAL POSITION

II. COLD MEASUREMENTS

- FUNCTION OF POSITION, CURRENT
- COMPARE WITH ROOM TEMPERATURE
- STUDY EFFECT OF THERMAL CYCLE

TEST FACILITY SUPERCONDUCTING MAGNET R&D LABORATORY (LAB2)

**3 Vertical Dewars (Longest 3.6 Meters)
Temperature Range 3.2 K to 4.35 K
Instrumented with Pressure Transducers,
Liquid Level Gauges, and Thermometers**

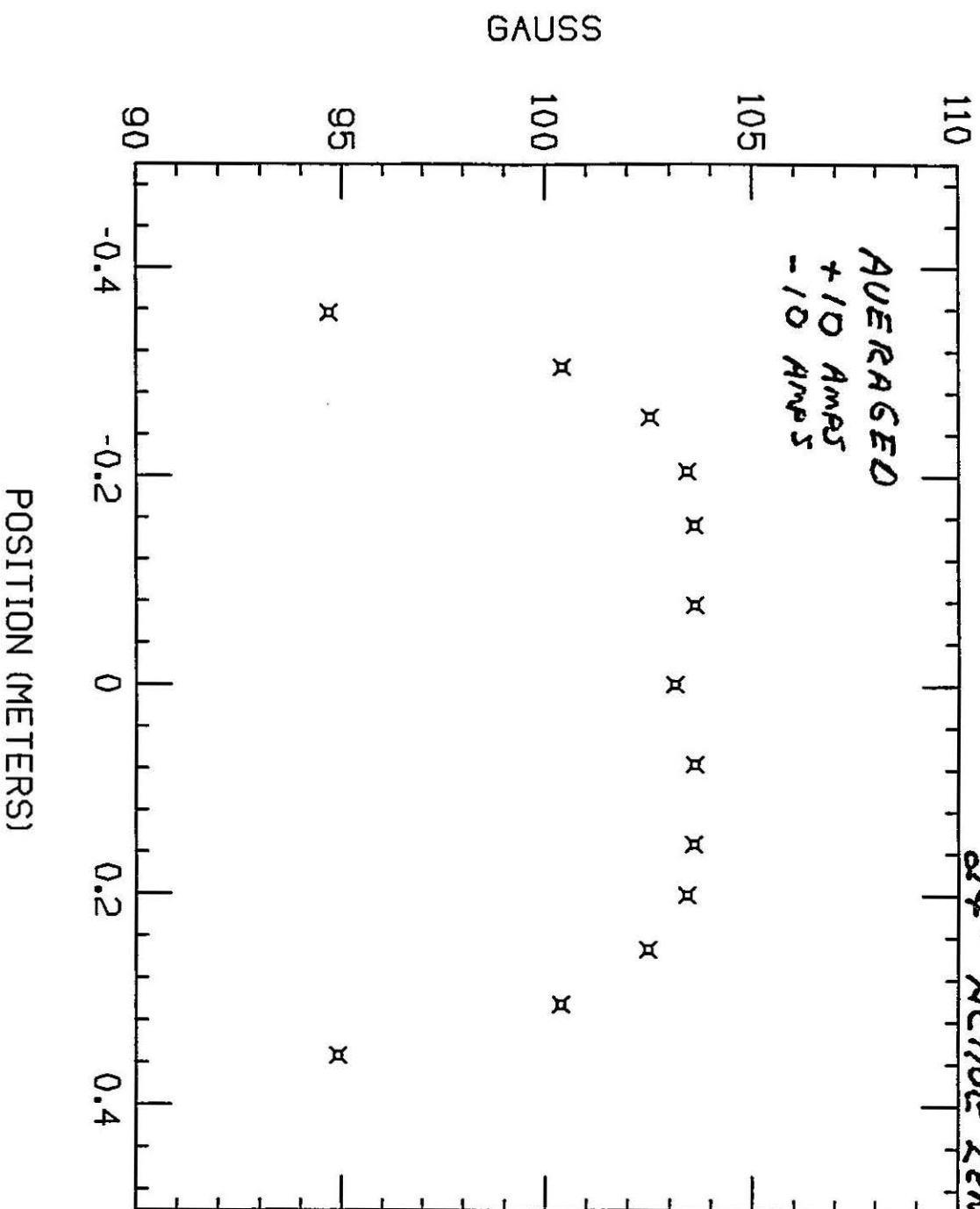
**Power Supplies 3 Transrex 500-5
Up to 20,000 A**

**Data Acquisition
Micro-Vax
CAMAC Based**

**Magnetic Measurement System
Multiple Winding Morgan Coil 1cm Radius
In Anti-Cryostat Inserted in Magnet Bore
V/F Converter Based Measuring System
Maximum Data Acquisition Rate 3 Hz**

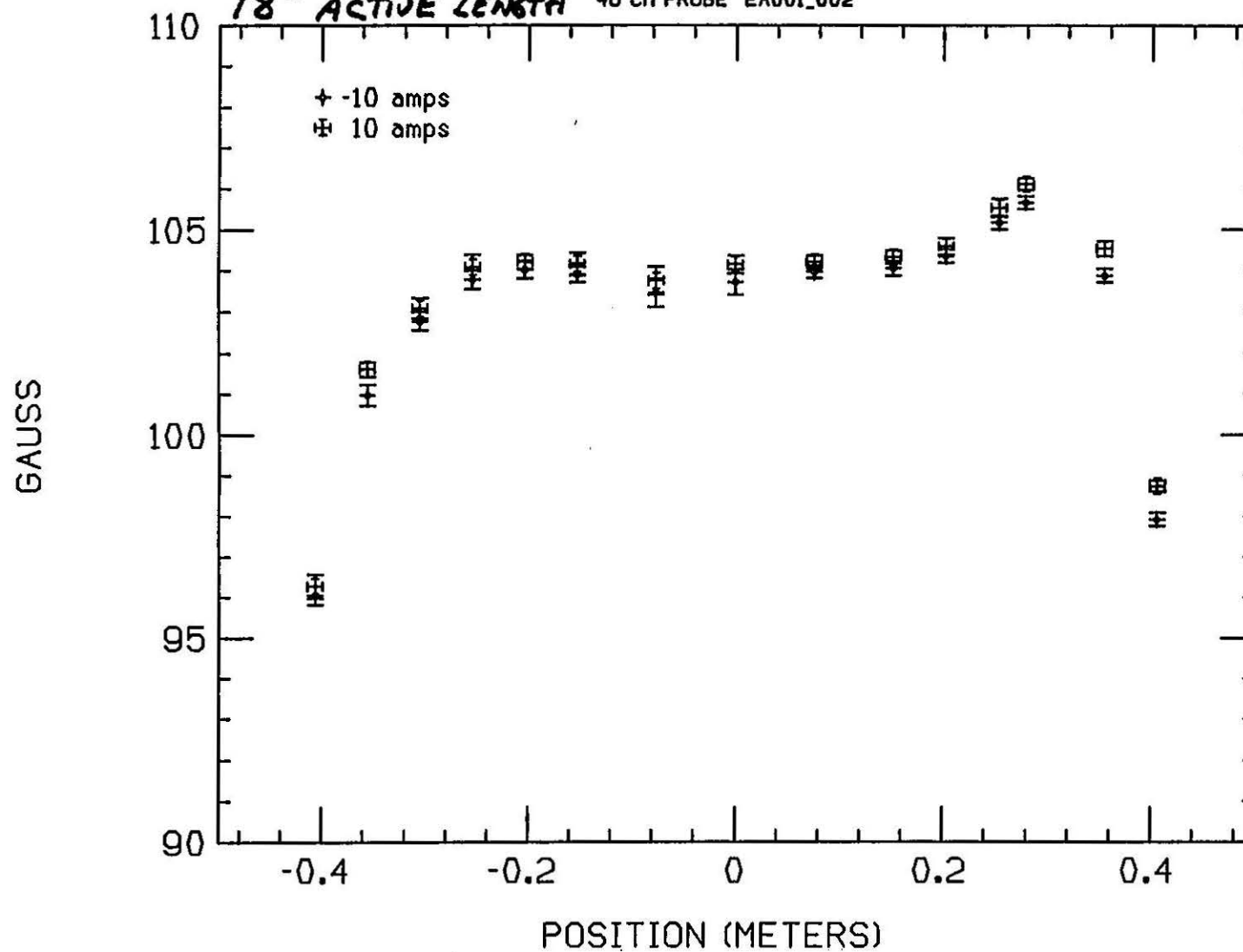
DIPOLE WITH MOLE (DS0309)

24" Active Length

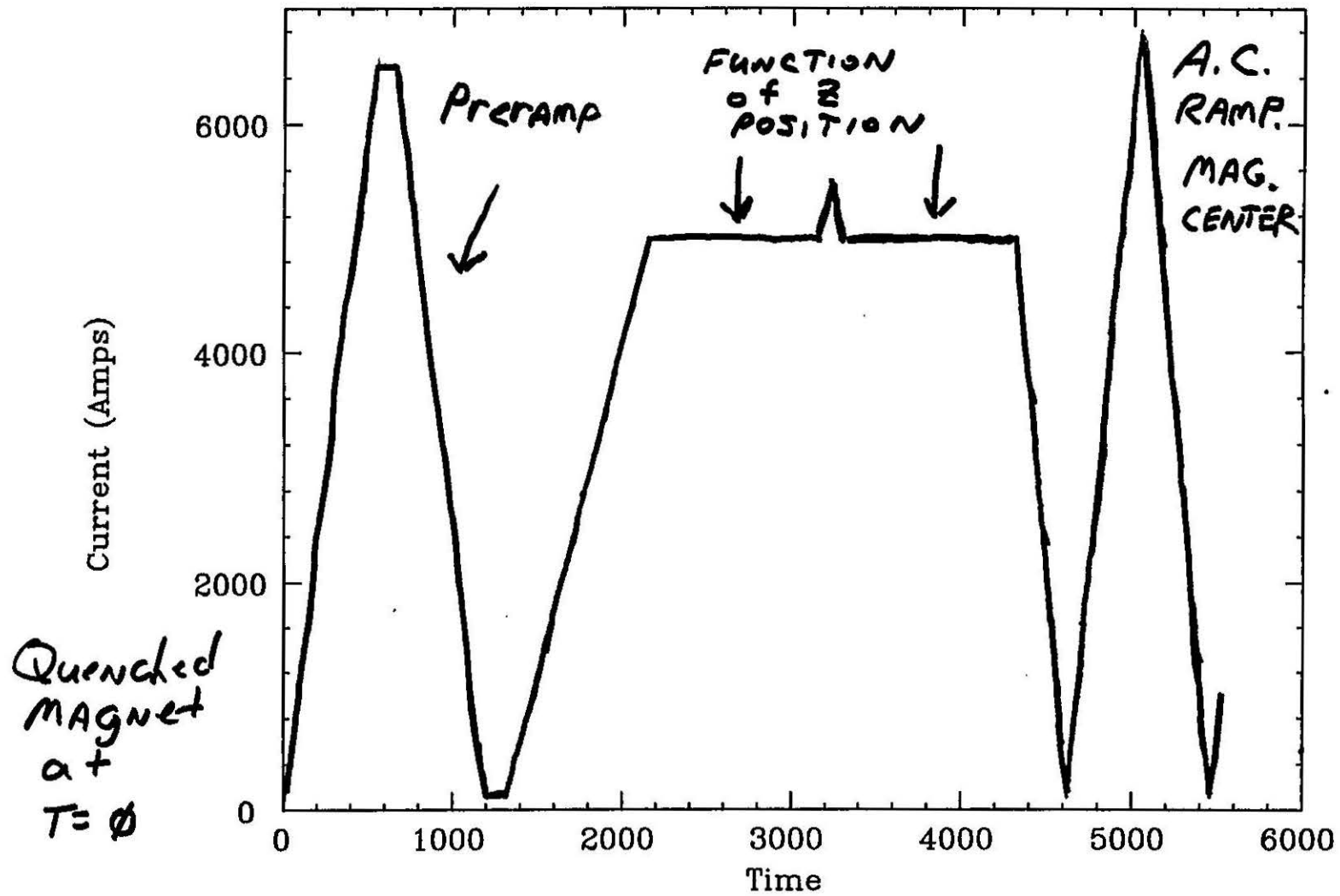


DIPOLE DS0309 ROOM TEMPERATURE

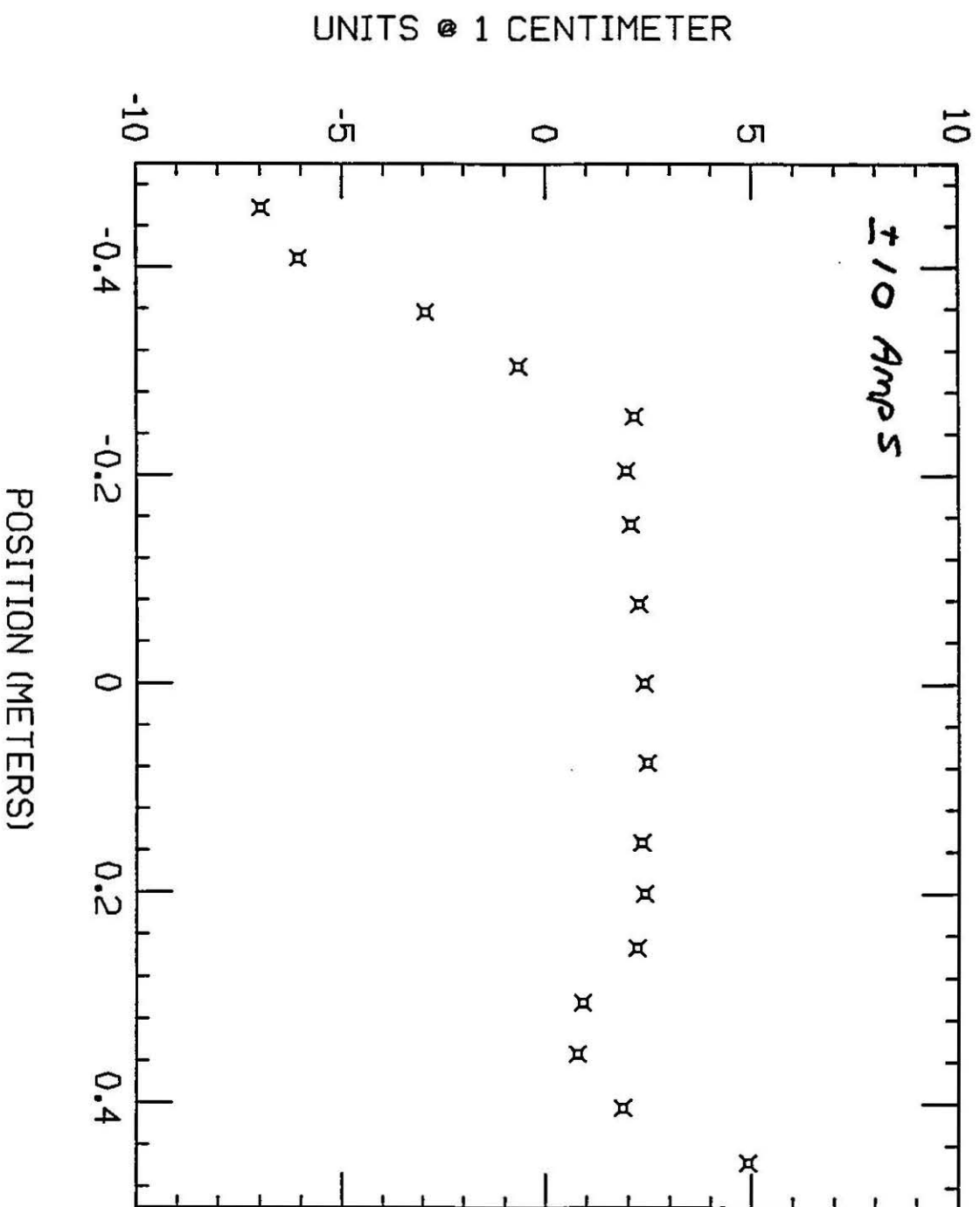
18" ACTIVE LENGTH 48 CM PROBE EA001_002



Waveform for Magnetic Measurements

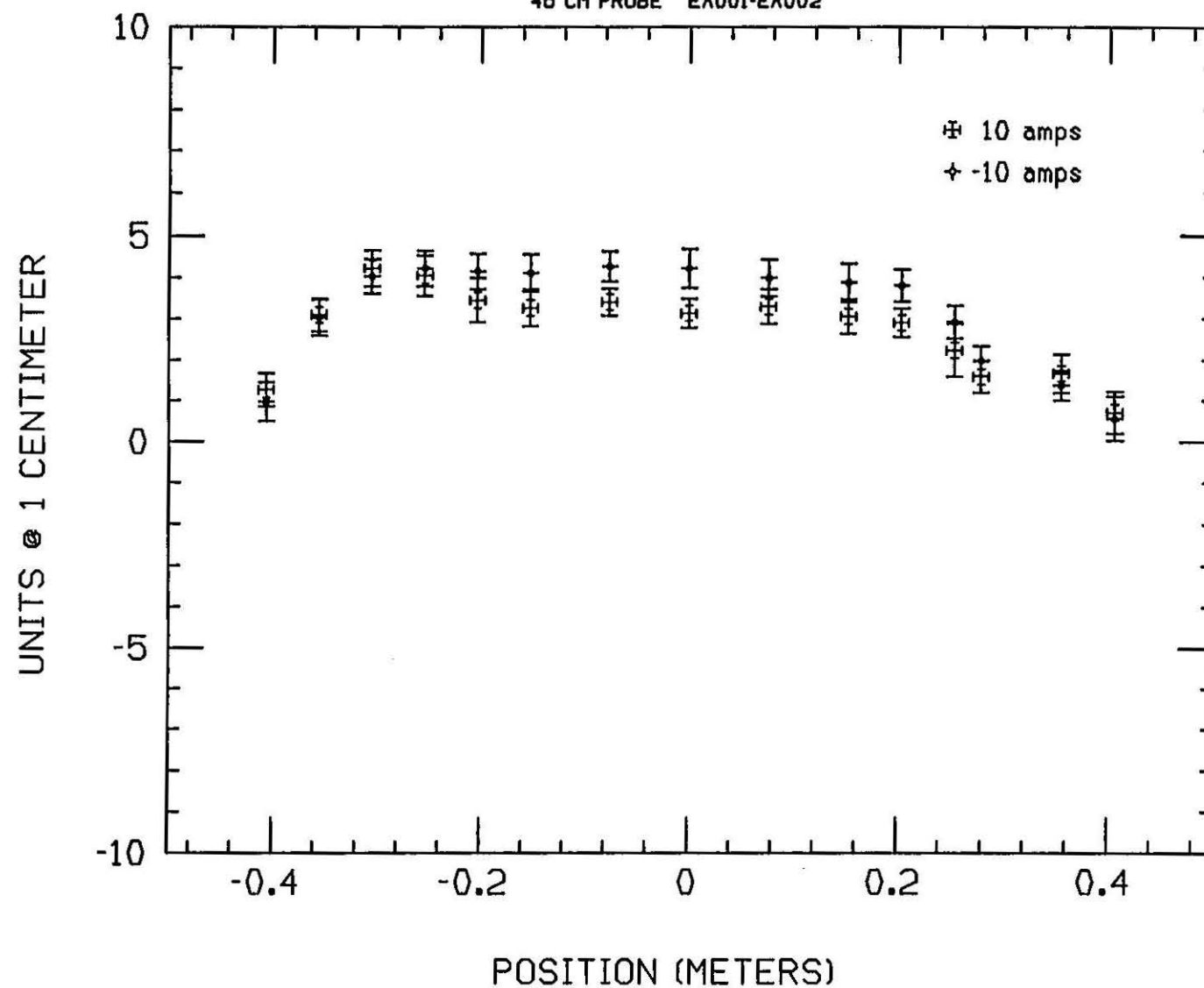


NORMAL SEXTUPOLE WITH MOLE (DS0309)



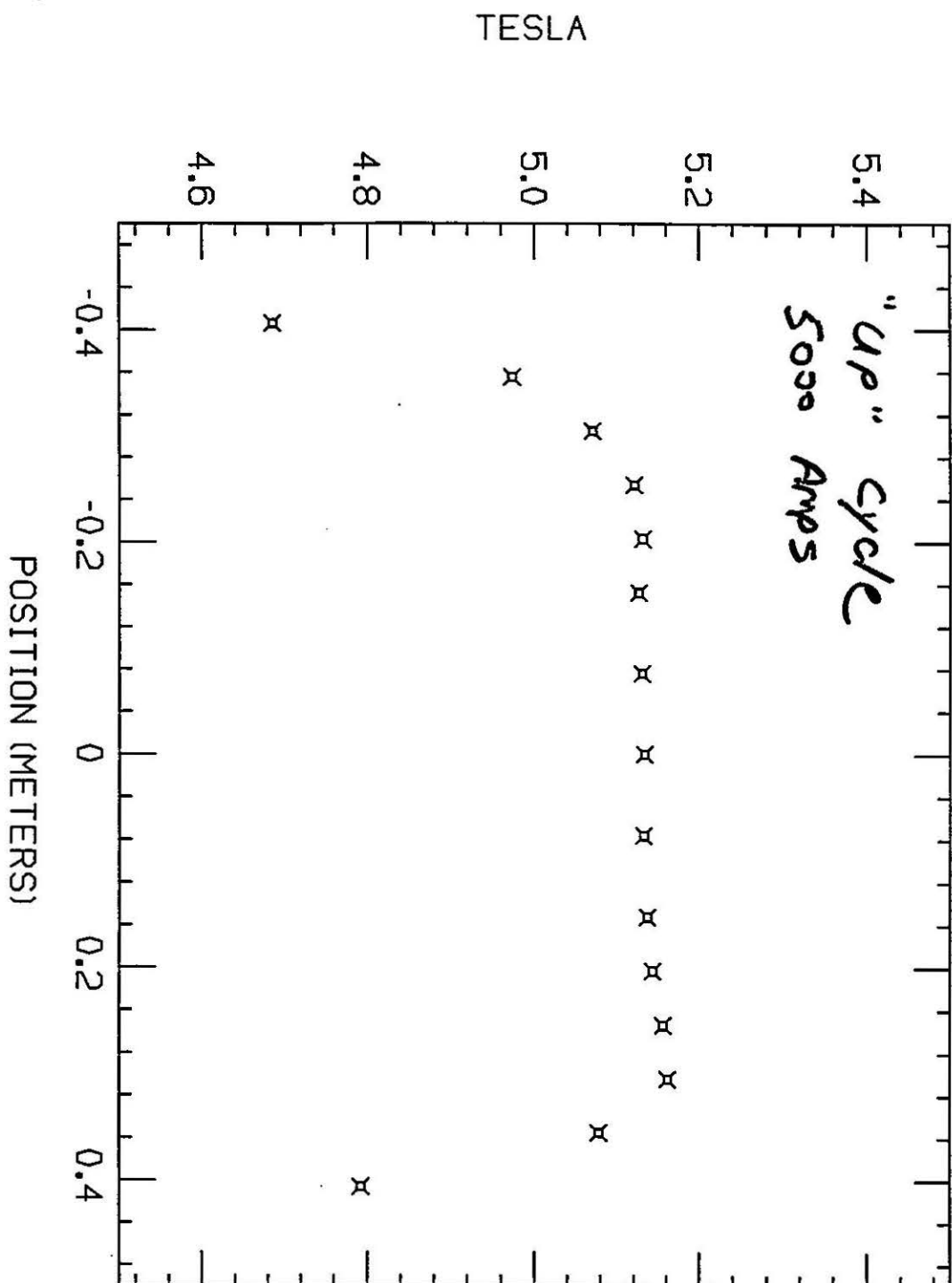
NORMAL SEXTUPOLE DS0309 ROOM TEMPERATURE

46 CM PROBE EA001-EA002



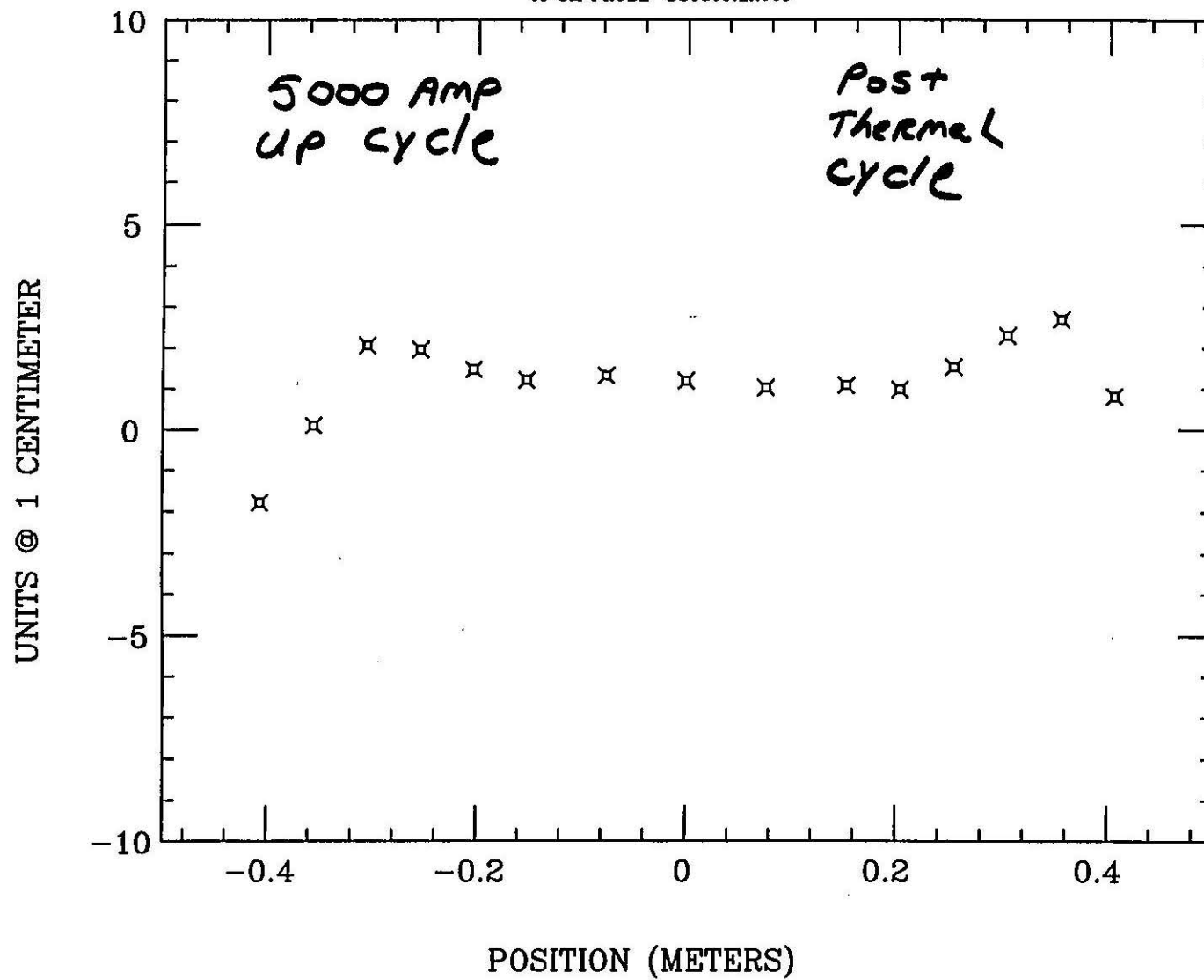
DIPOLE DS0309

46 CH DS0309.EA009



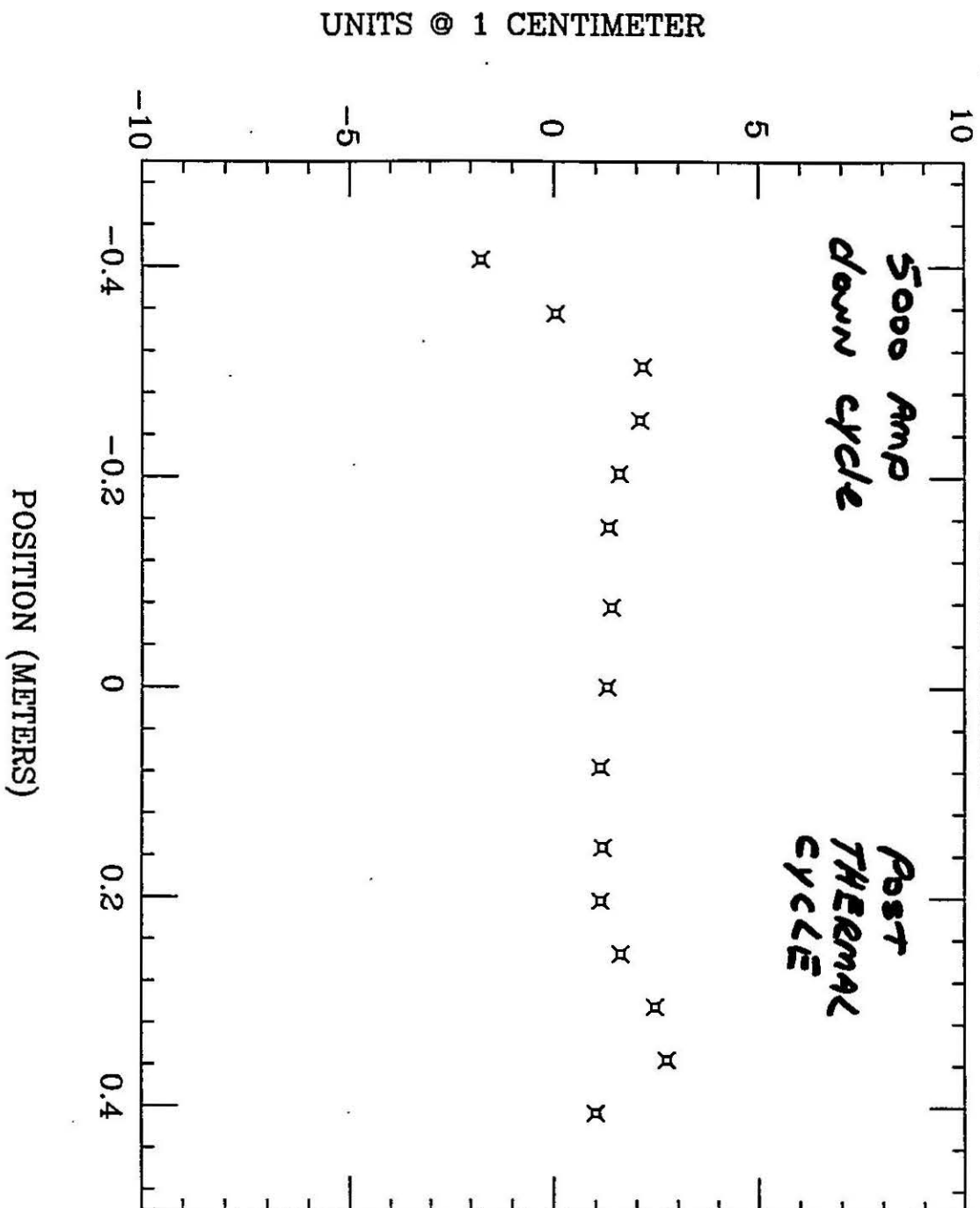
NORMAL SEXTUPOLE DS0309

46 CM PROBE DS0309.EA009



NORMAL SEXTUPOLE DS0309

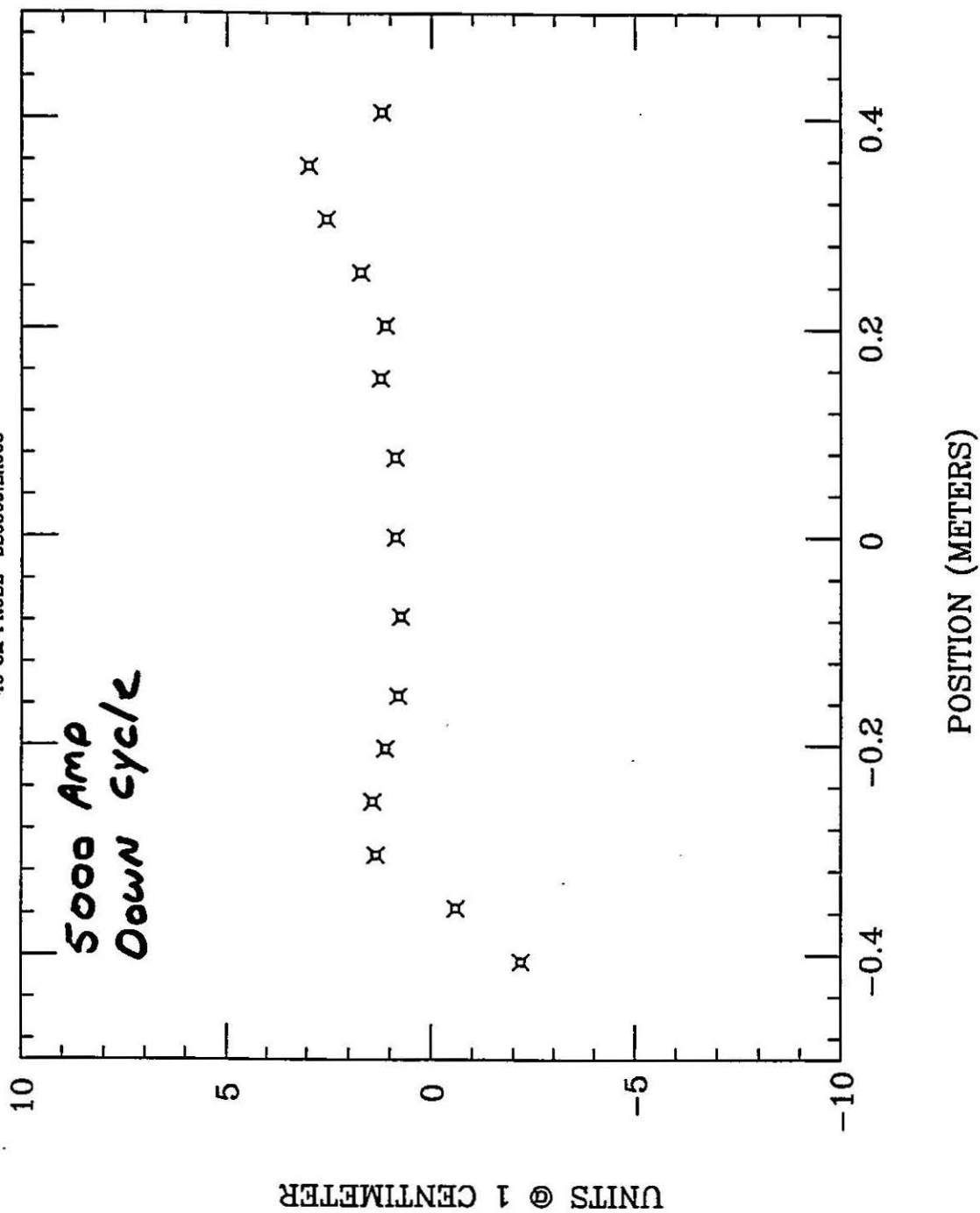
46 CM PROBE DS0309.EA010



NORMAL SEXTUPOLE DS0309

48 CM PROBE DS0309.EA005

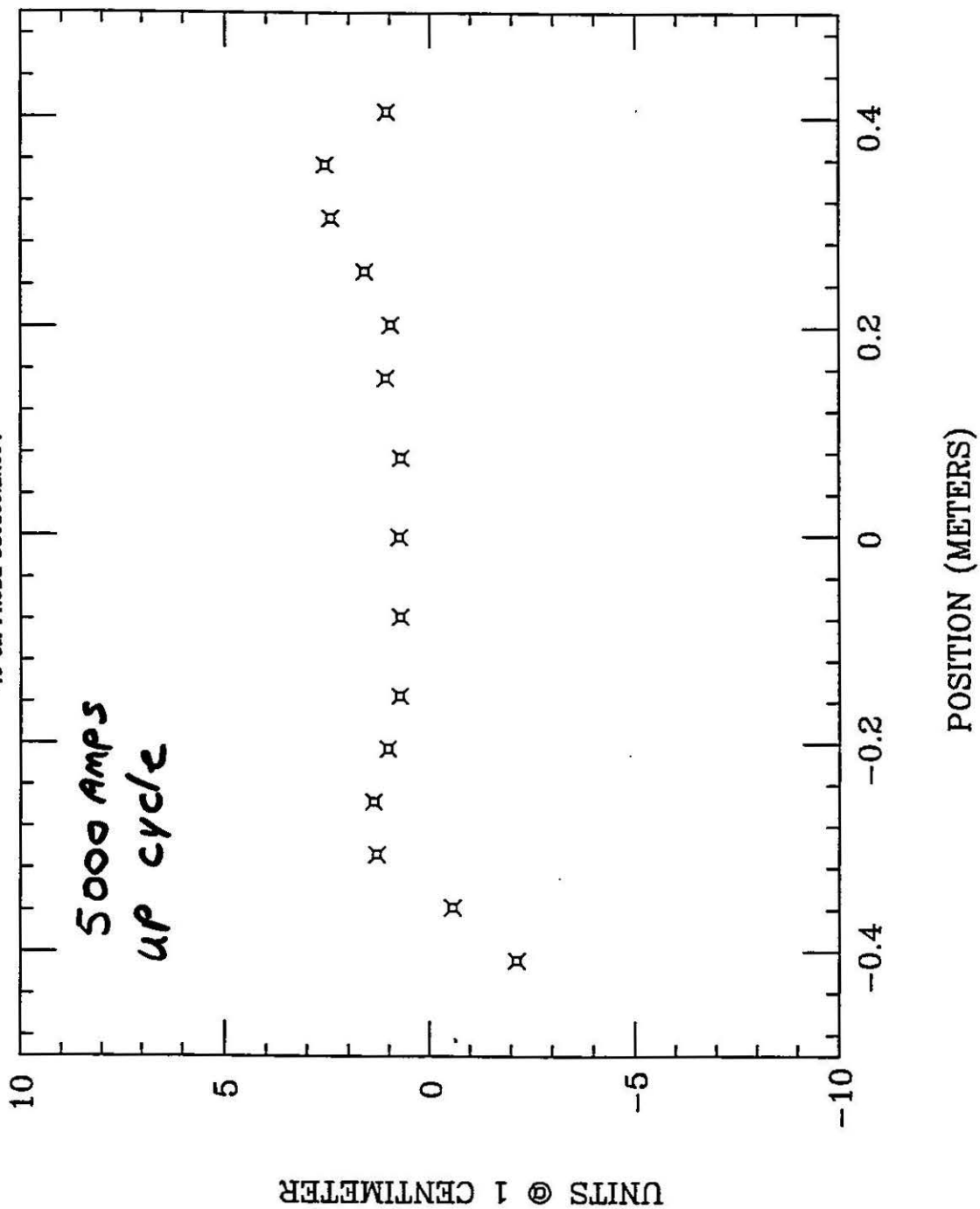
*5000 Amp
Down cycle*



NORMAL SEXTUPOLE DS0309

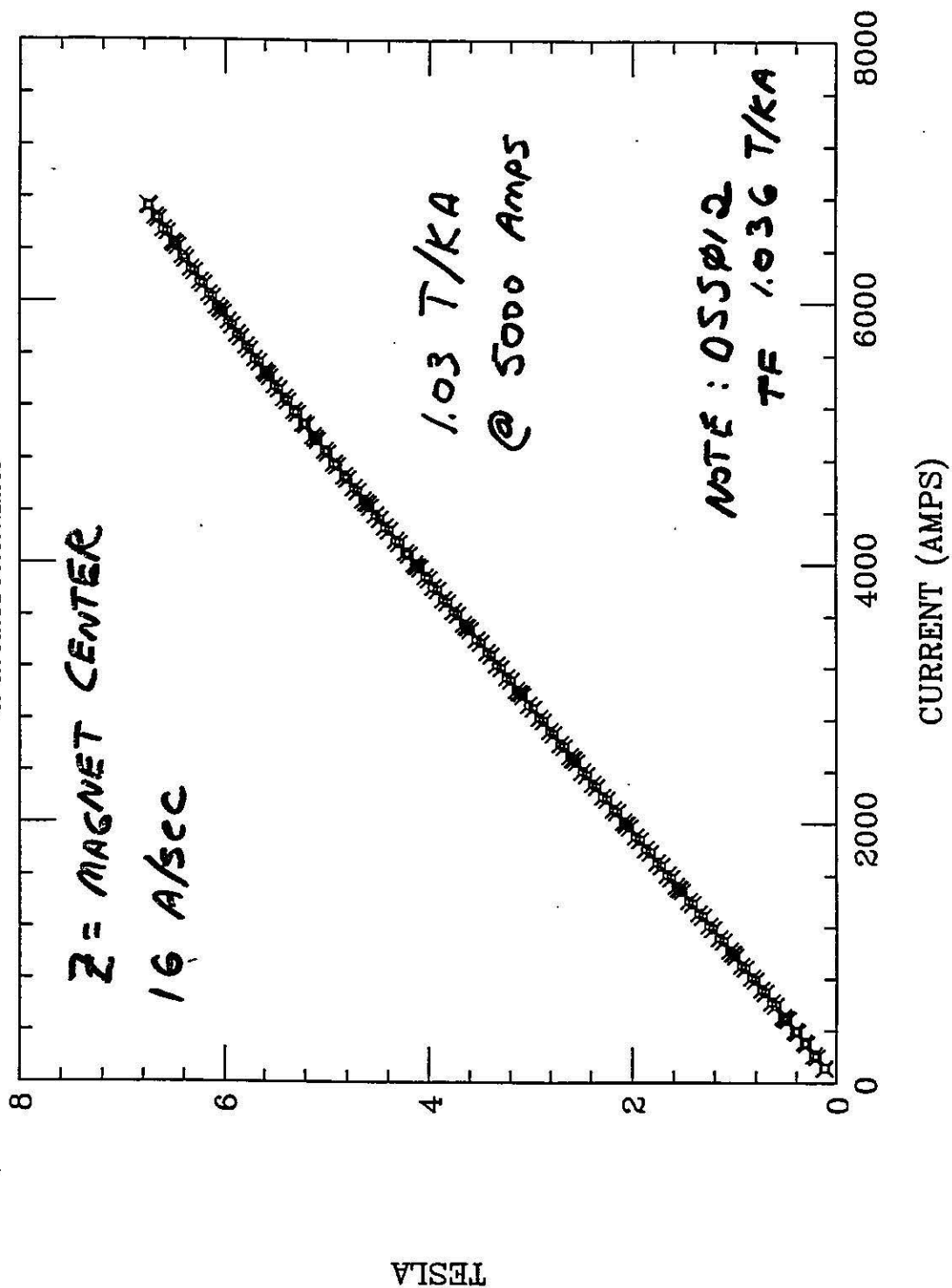
46 CM PROBE DS0309.EA004

5000 AMPS
UP CYCLE



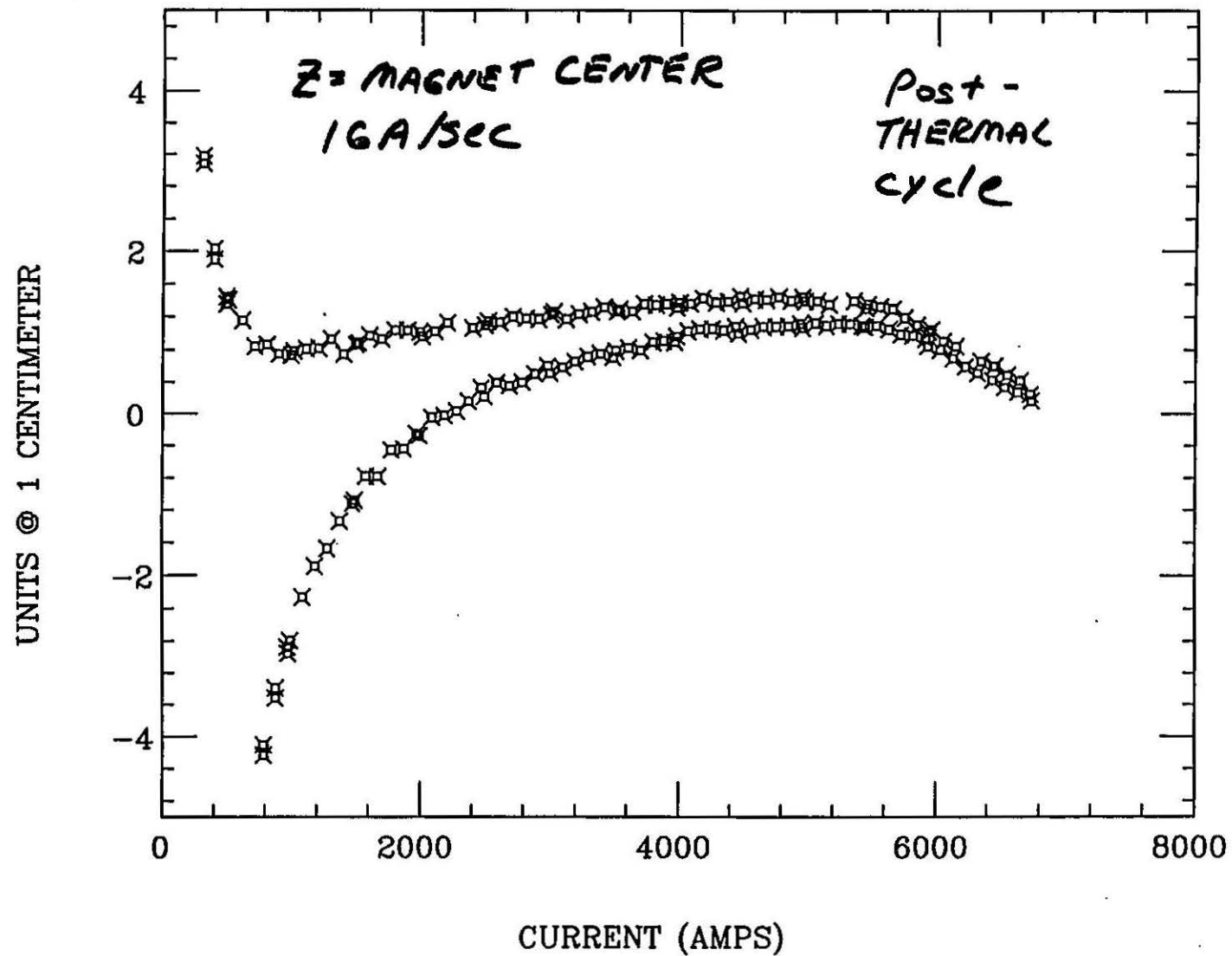
DIPOLE DS0309

46 CM PROBE DS0309.EA011



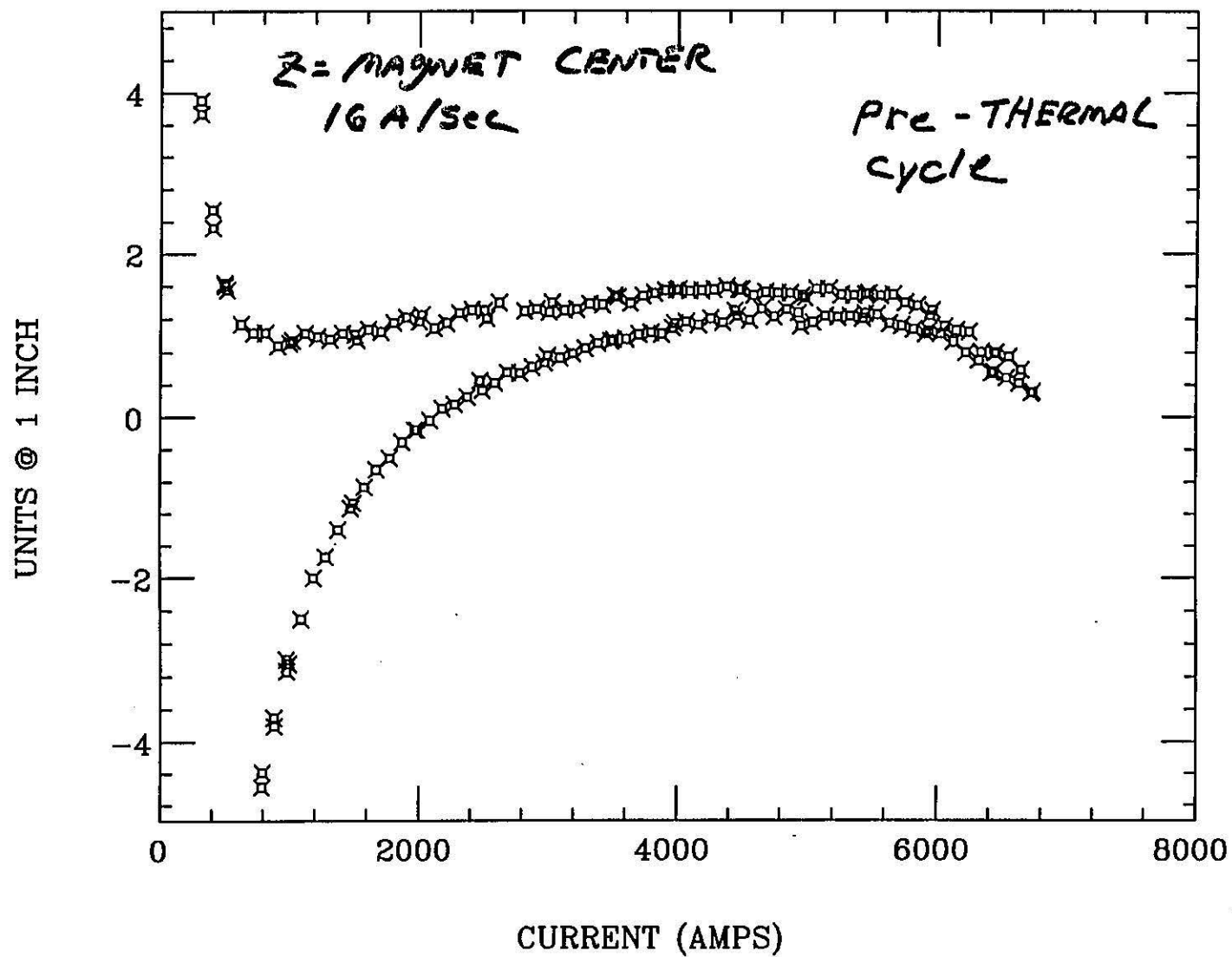
NORMAL SEXTUPOLE DS0309

46 CM PROBE DS0309.EA011



NORMAL SEXTUPOLE DS0309

46 CM PROBE DS0308.EA007



DS0309 MEASURED GEOMETRIC MULTIPOLES (AT 5000 AMPS)

TRANSFER FUNCTION 1.03 TESLA/KAMP

MULTIPOLE UNITS @ 1 CM	SKEW	NORMAL
QUADRUPOLE	-0.13	- 1.2
SEXTUPOLE	-0.07	+1.3
OCTAPOLE	+0.35	-0.10
DECAPOLE	-0.07	-0.56
12-POLE	-0.16	+ .03
18-POLE	-0.03	-0.03
20-POLE	-0.04	-0.03

CONCLUSIONS

I. ROOM TEMPERATURE

- CROSS CALIBRATION OF MOLE AND LAB2 SYSTEM

II. COLD MEASUREMENTS

- MEASURED GEOMETRIC MULTIPOLES ARE SMALL, LARGEST IS NORMAL SEXTUPOLE
- TRANSFER FUNCTION AGREES WITH ROOM TEMPERATURE
- SEXTUPOLE HYSTERESIS HAS AN INTERESTING SHAPE
- THERMAL CYCLE HAS A MINIMAL EFFECT ON HARMONICS