Cold Test Data in D1L103
(Updated September 23, 2002)

Animesh Jain
Superconducting Magnet Division
Brookhaven National Laboratory, Upton, NY 11973

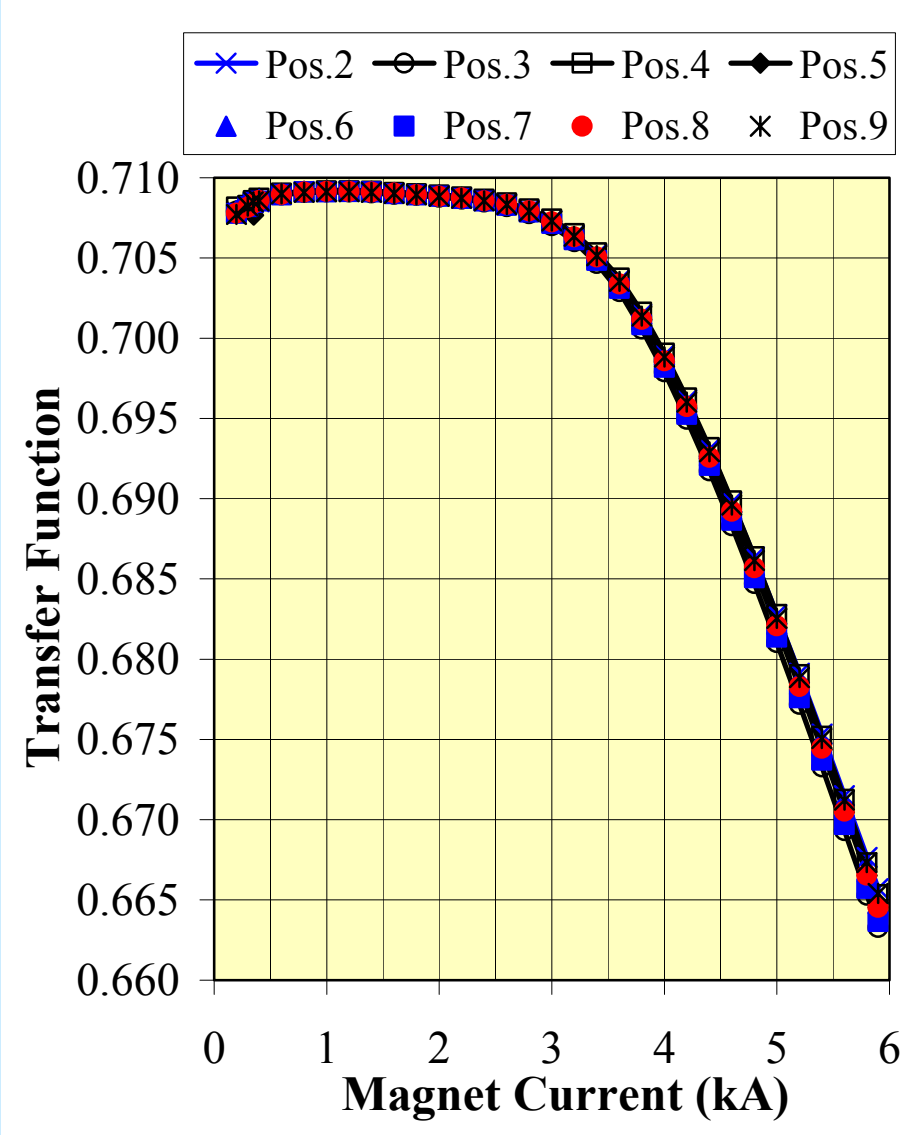
Available Cold Data in D1L103

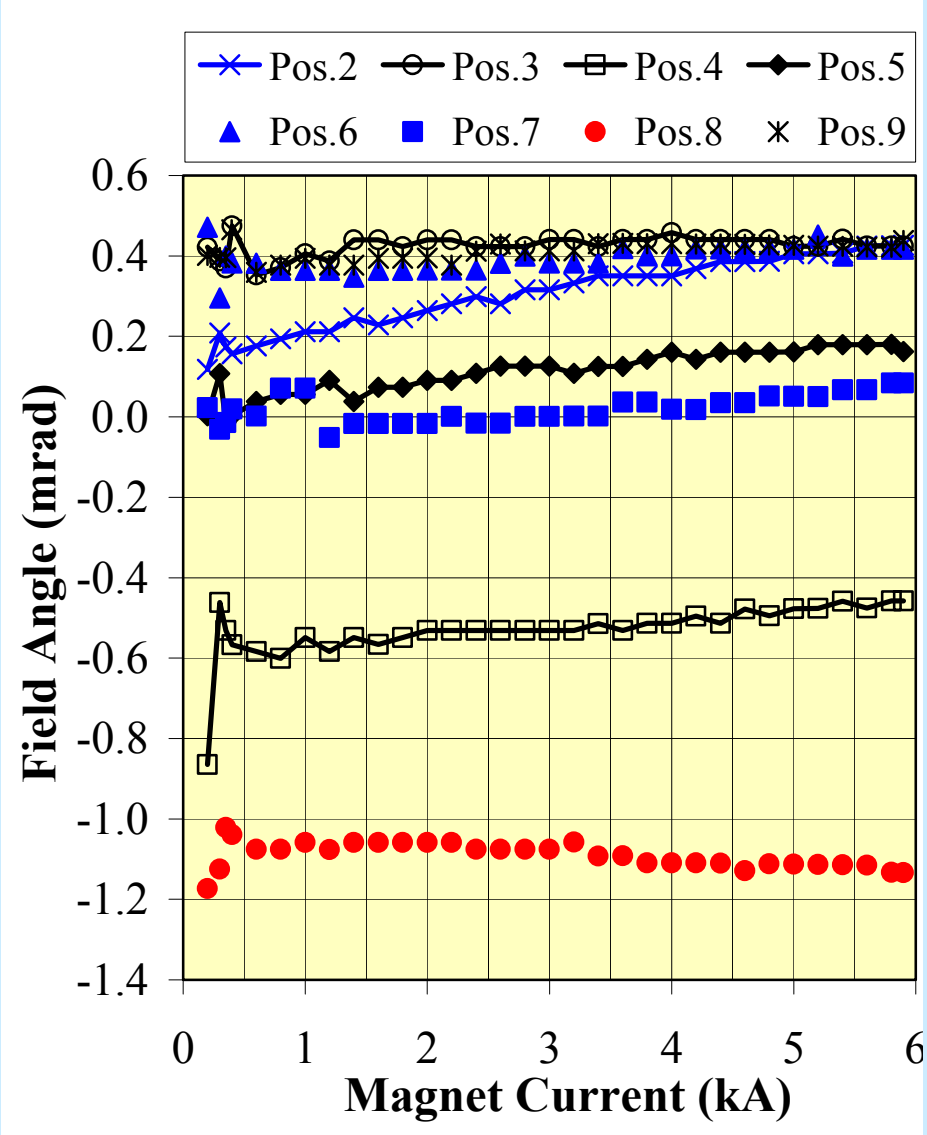
- "DC Loops" with a 1 meter long coil at 10 axial positions. (I_{max} = 5900 A; Up ramp Only)
- "DC Loops" with a 1 meter long coil near center position (I_{max} = 5900A & 6500 A, Up & Dn Ramp)
- Integral Transfer Function as a function of current using a 10 meter long non-rotating coil. (Magnet ramped at 20 A/s; 40 A/s and 60 A/s)
- Time decay and Snapback at 350A.
- "AC Loops" to 5900A at 5 A/s to 40 A/s.
- "AC Loops" to 6500A at 5 A/s to 40 A/s.

Excitation Curves at Various Positions

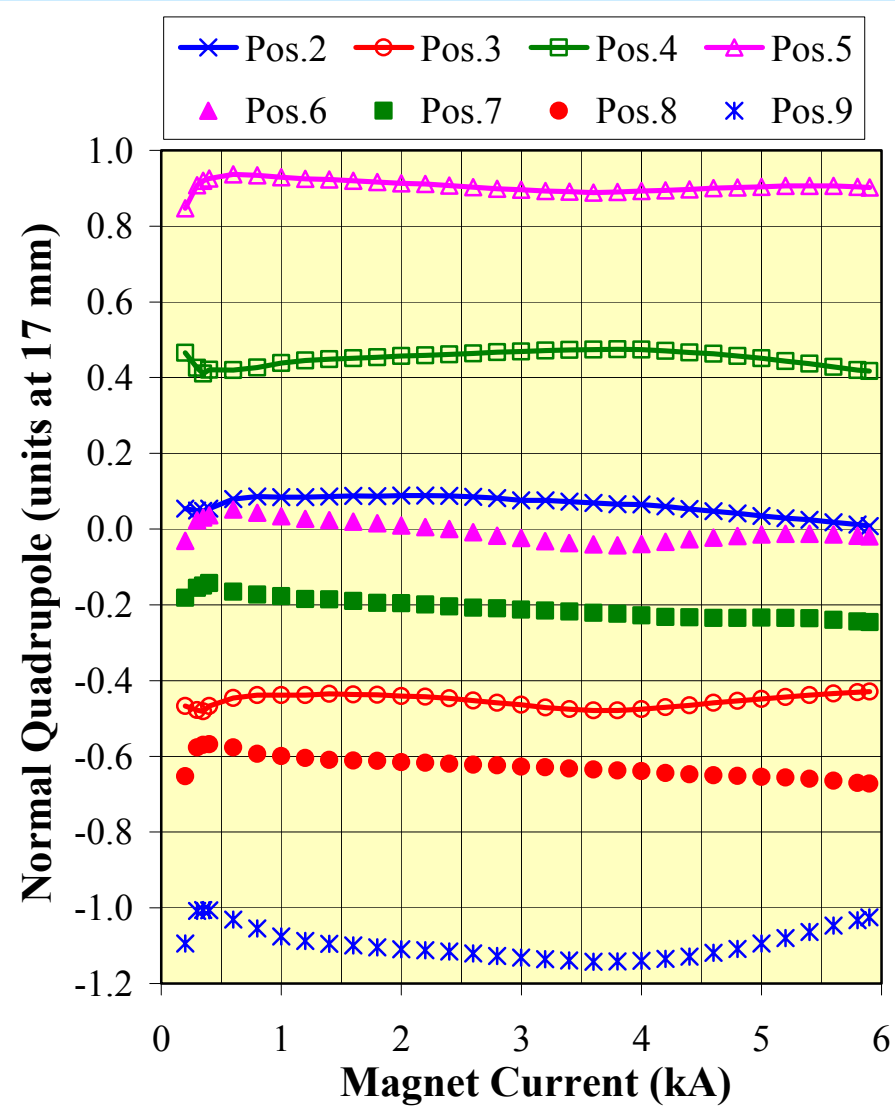
(Straight Section Data)

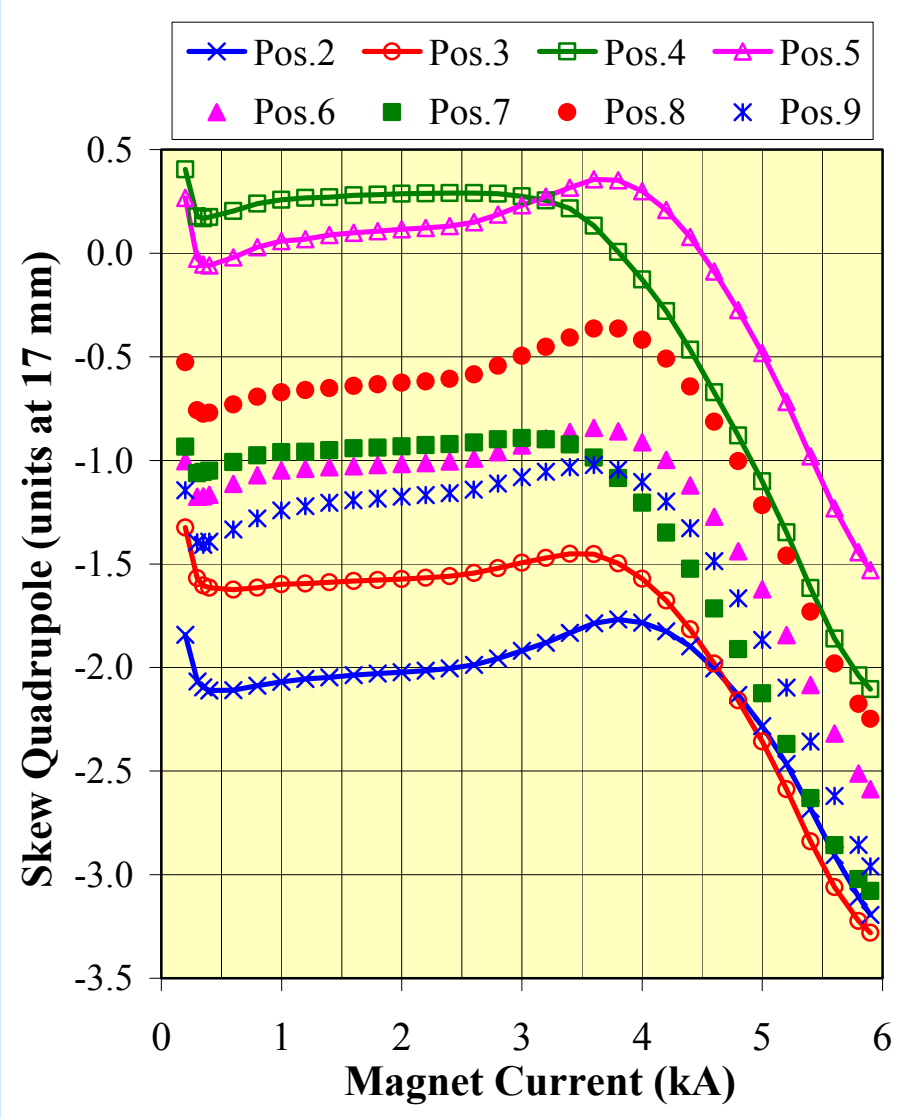
Excitation Curves in Straight Section of D1L103



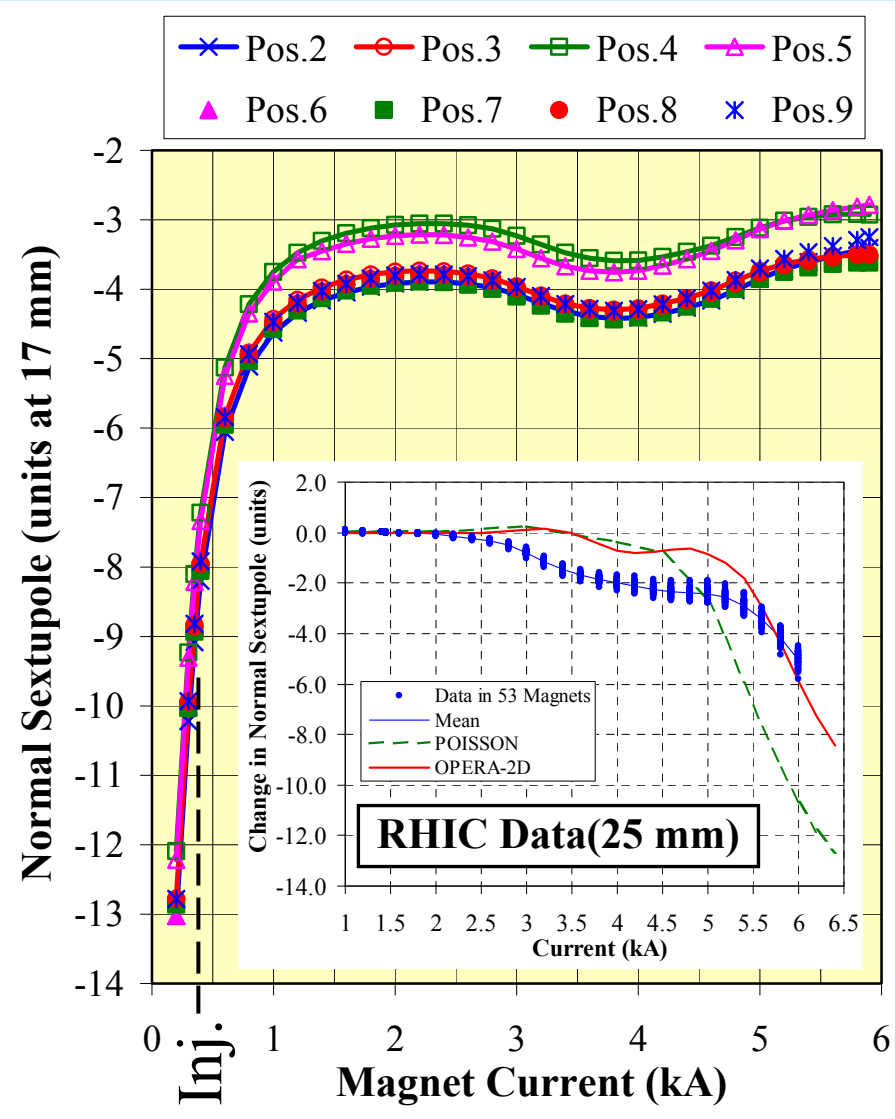


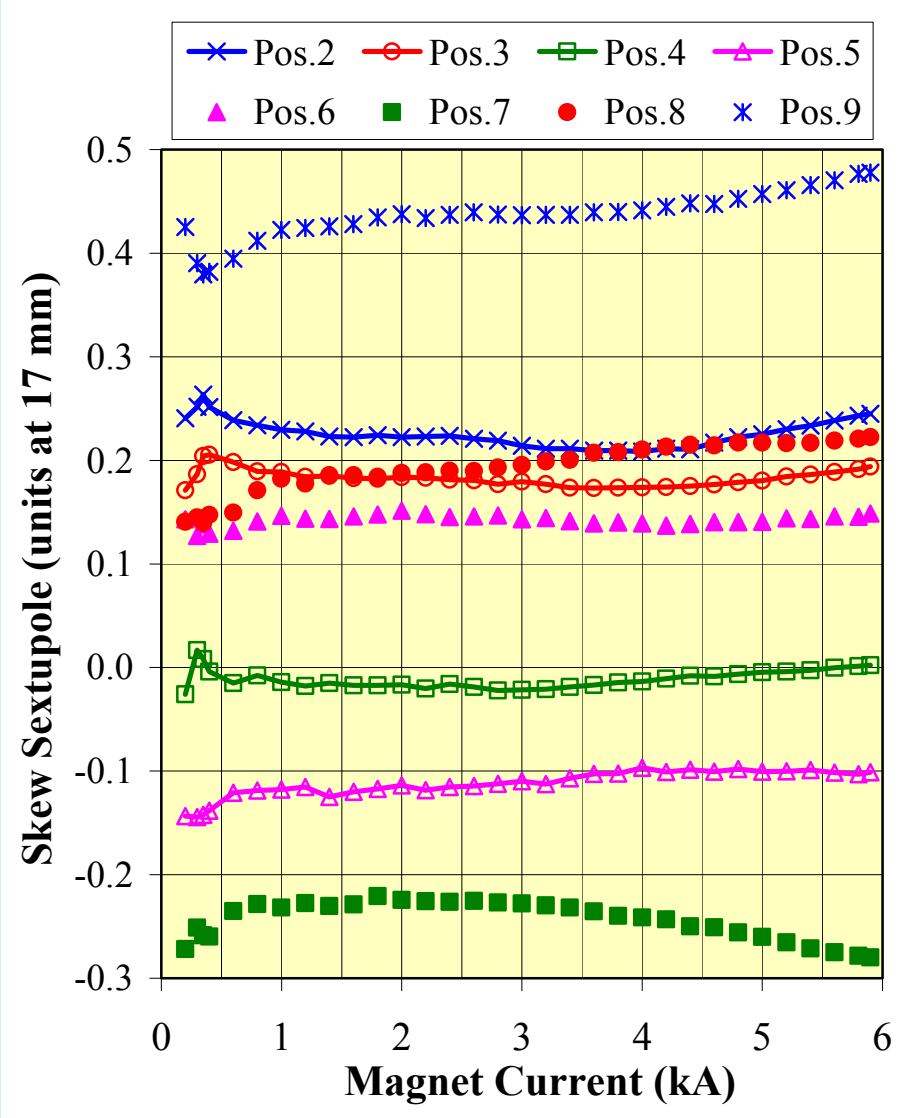
Excitation Curves in Straight Section of D1L103



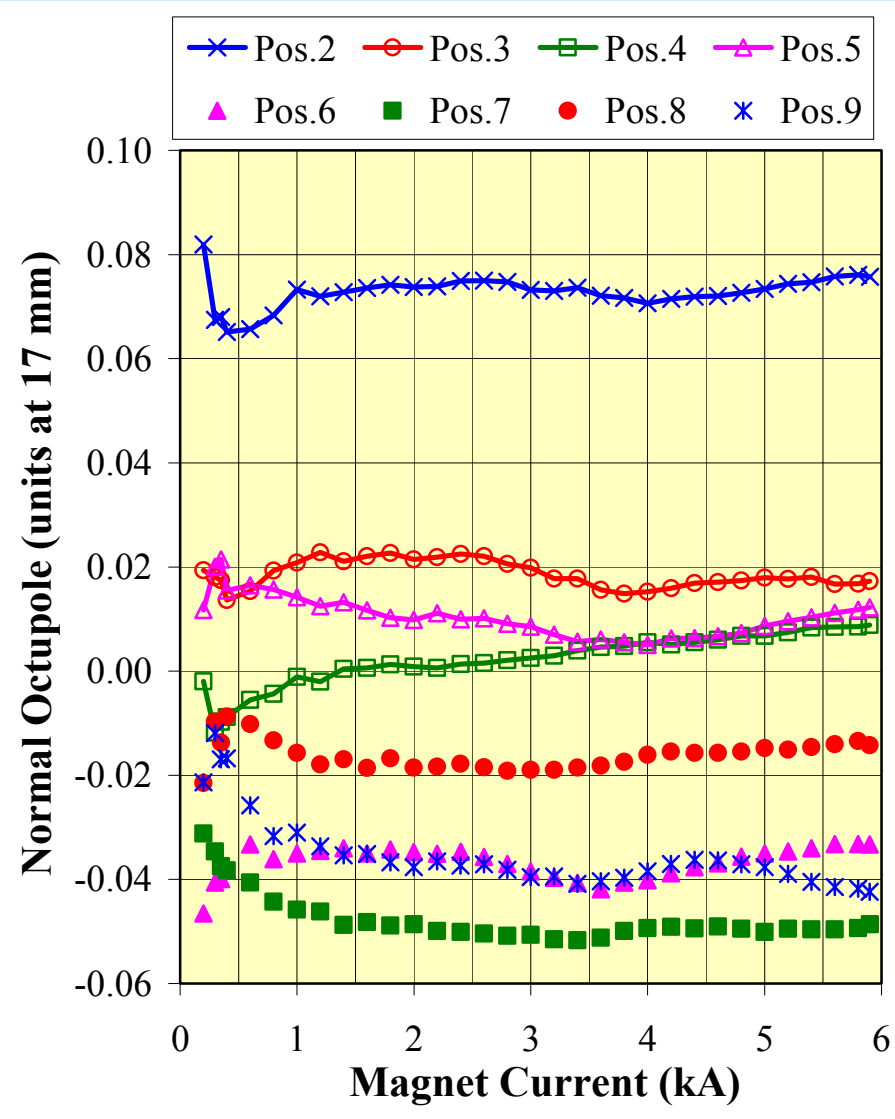


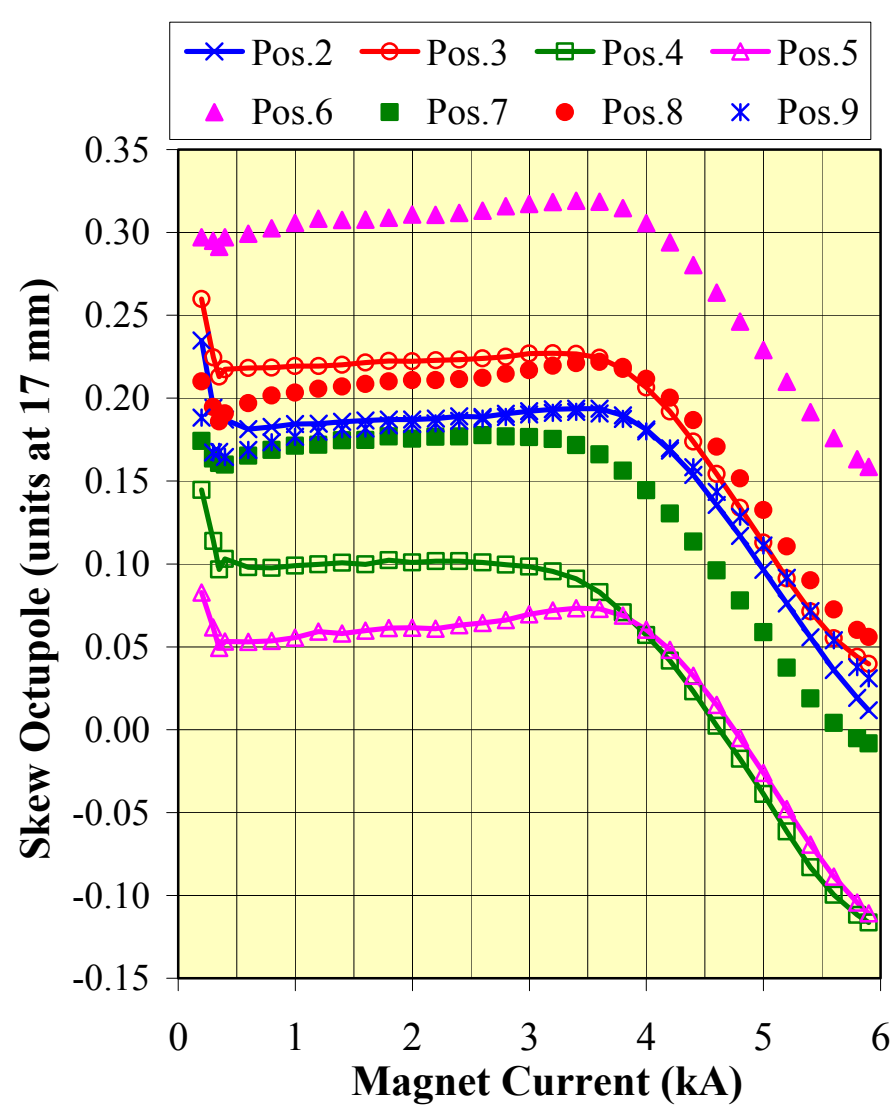
Excitation Curves in Straight Section of D1L103



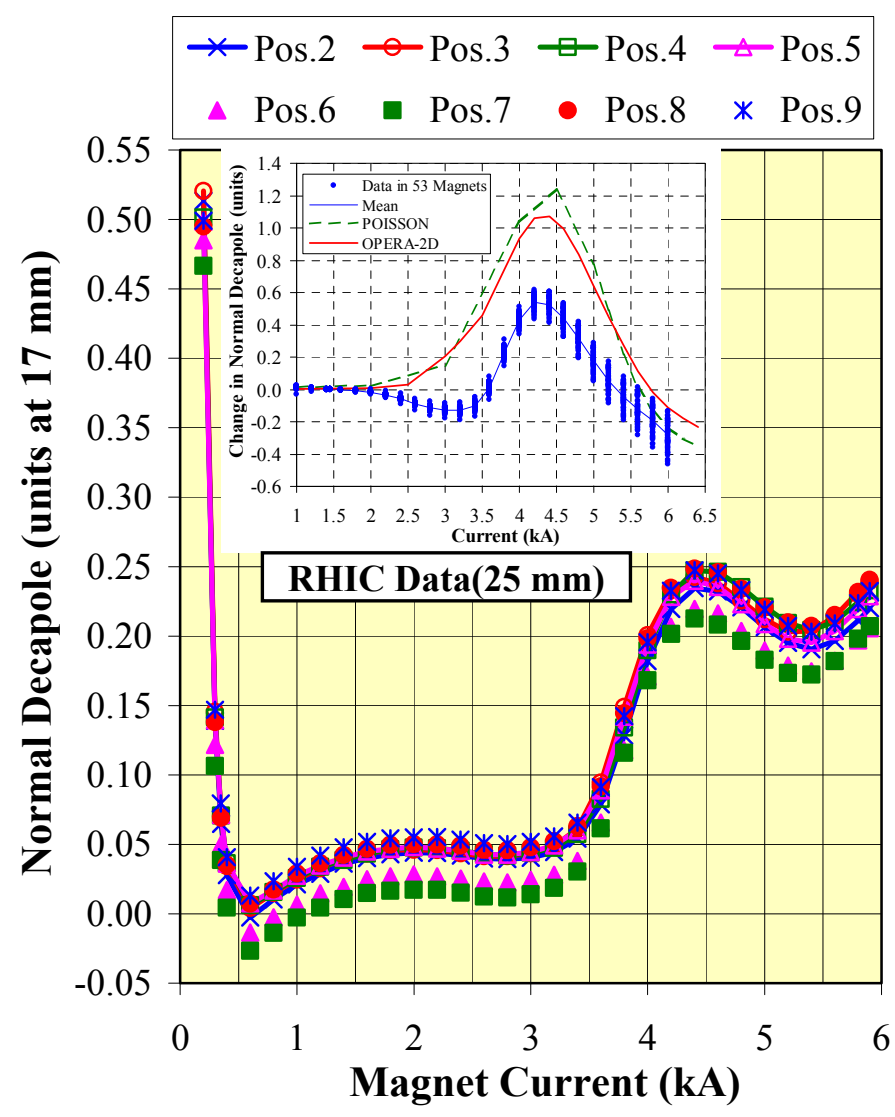


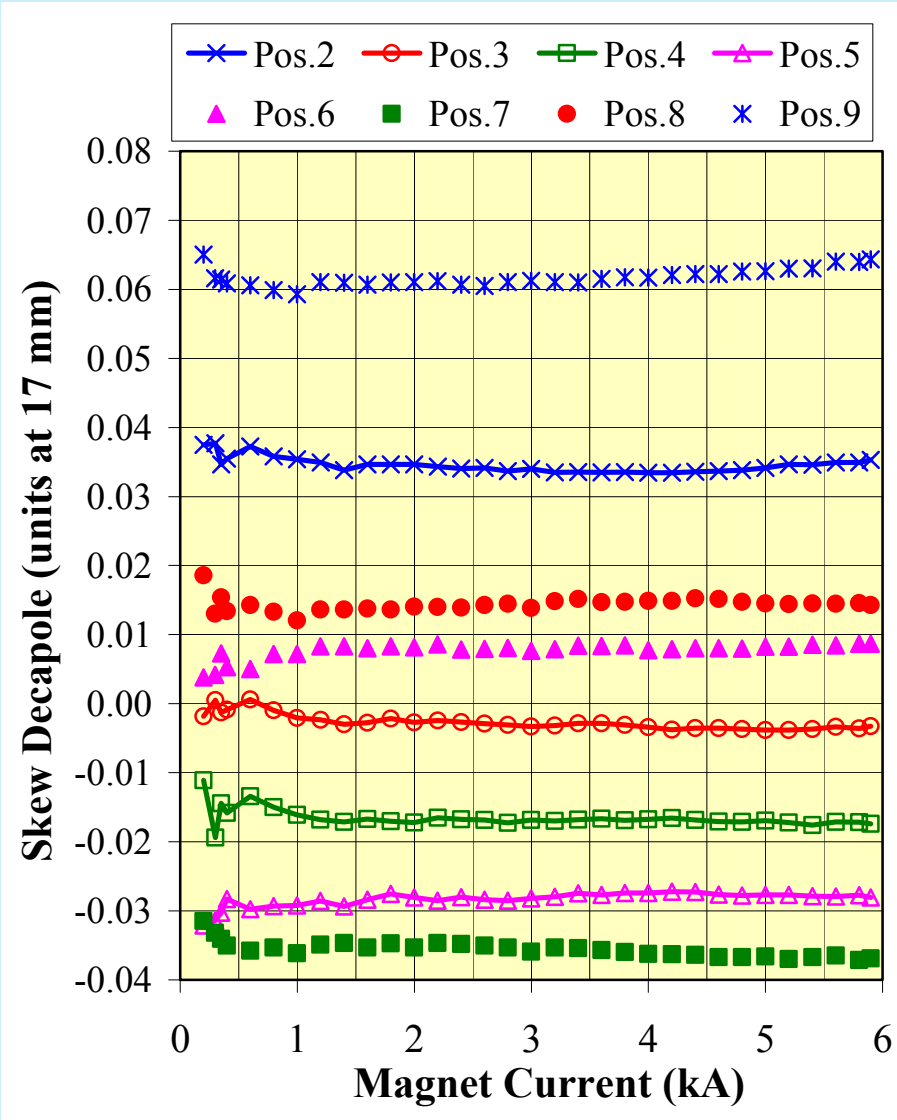
Excitation Curves in Straight Section of D1L103



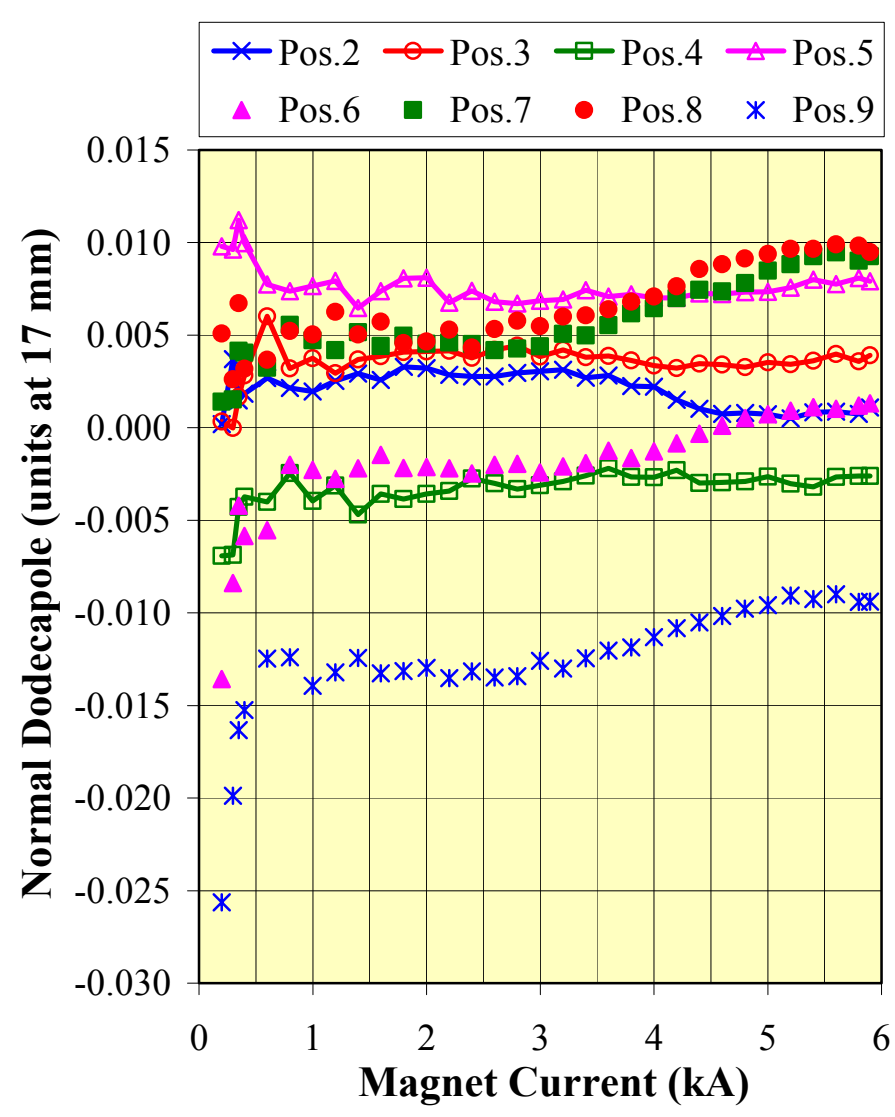


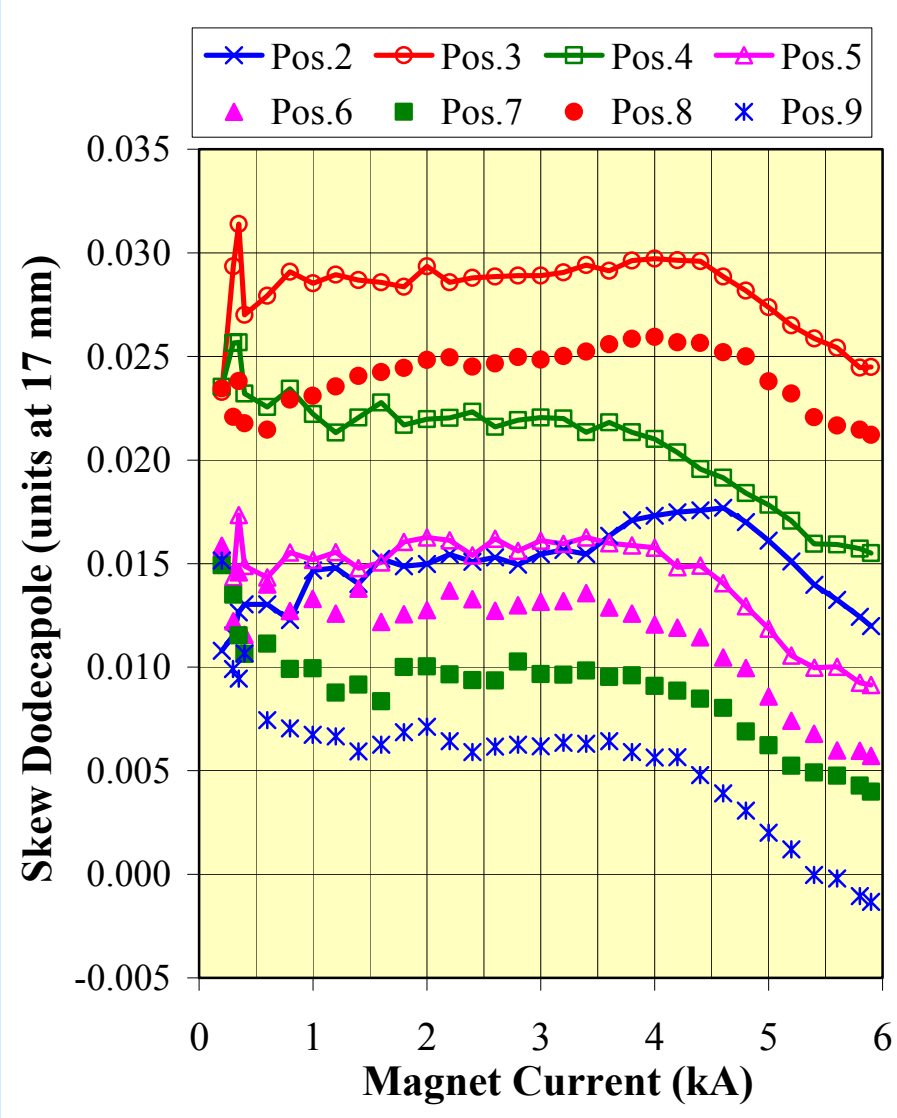
Excitation Curves in Straight Section of D1L103



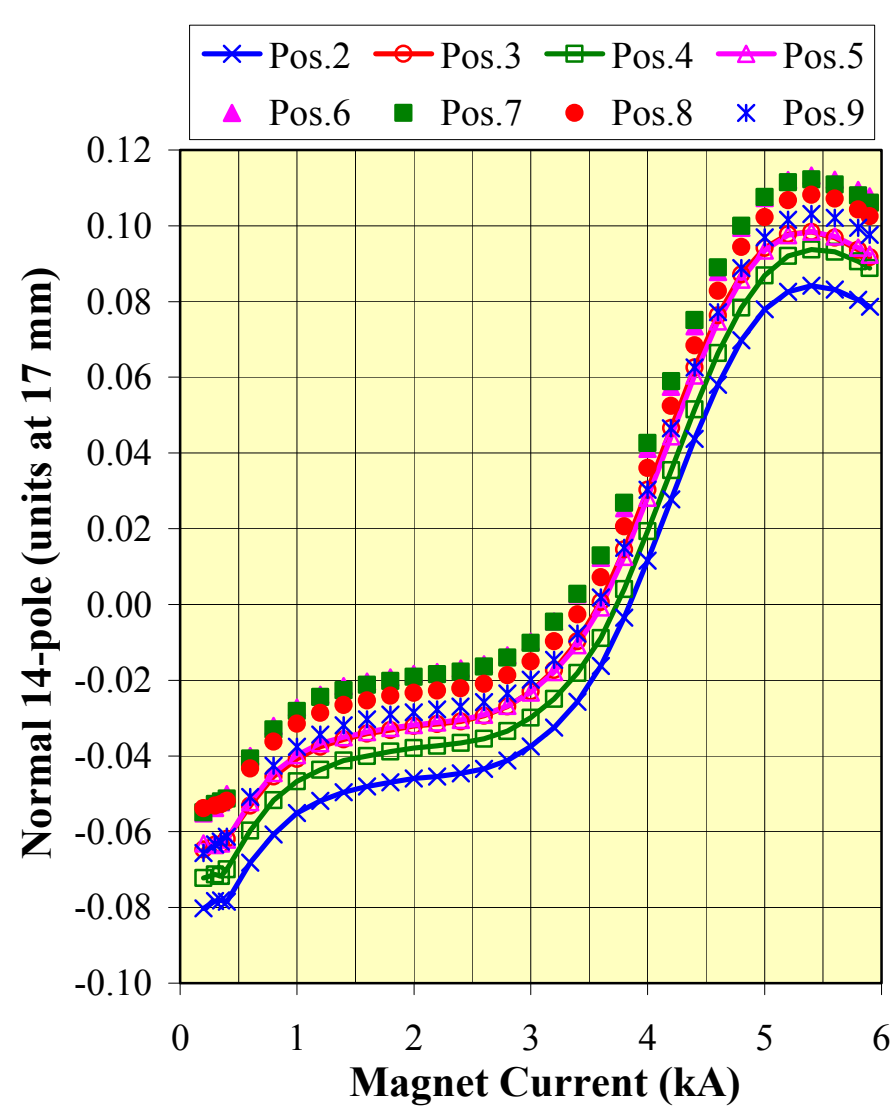


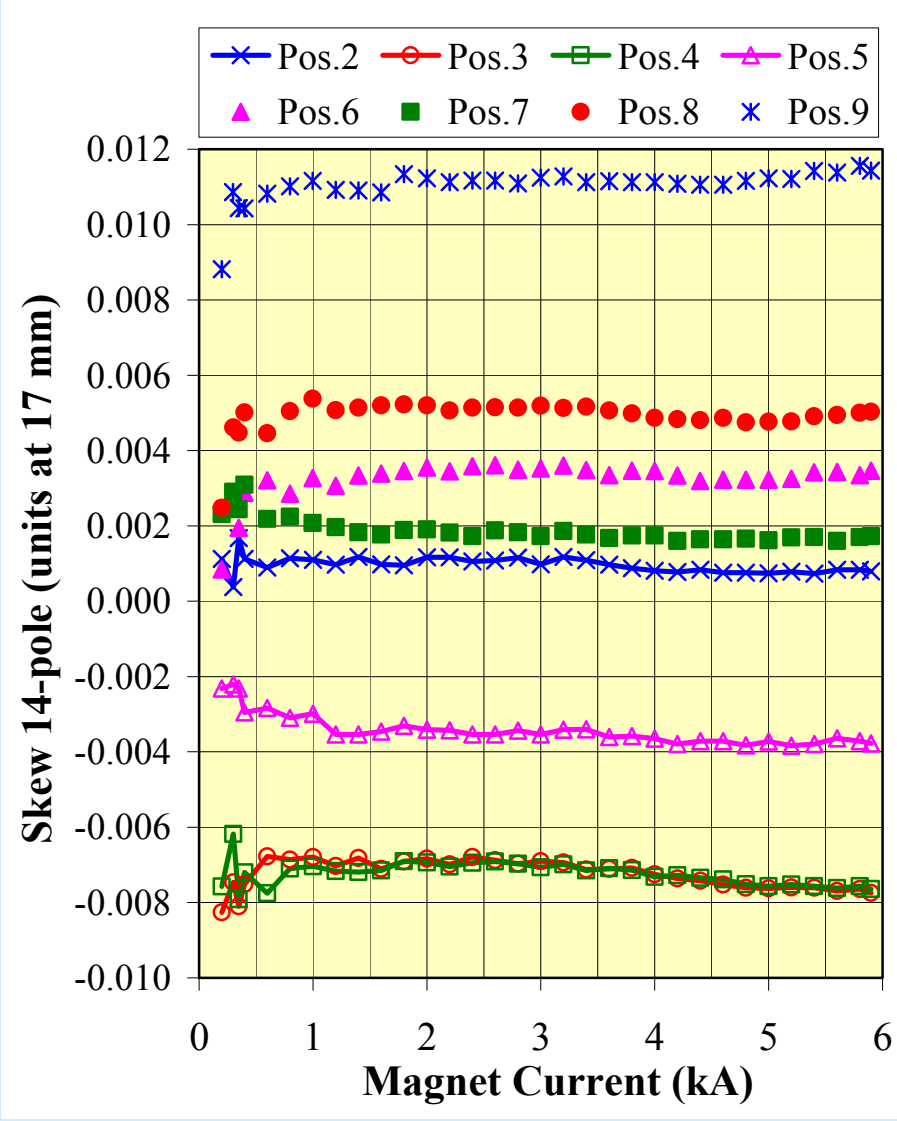
Excitation Curves in Straight Section of D1L103



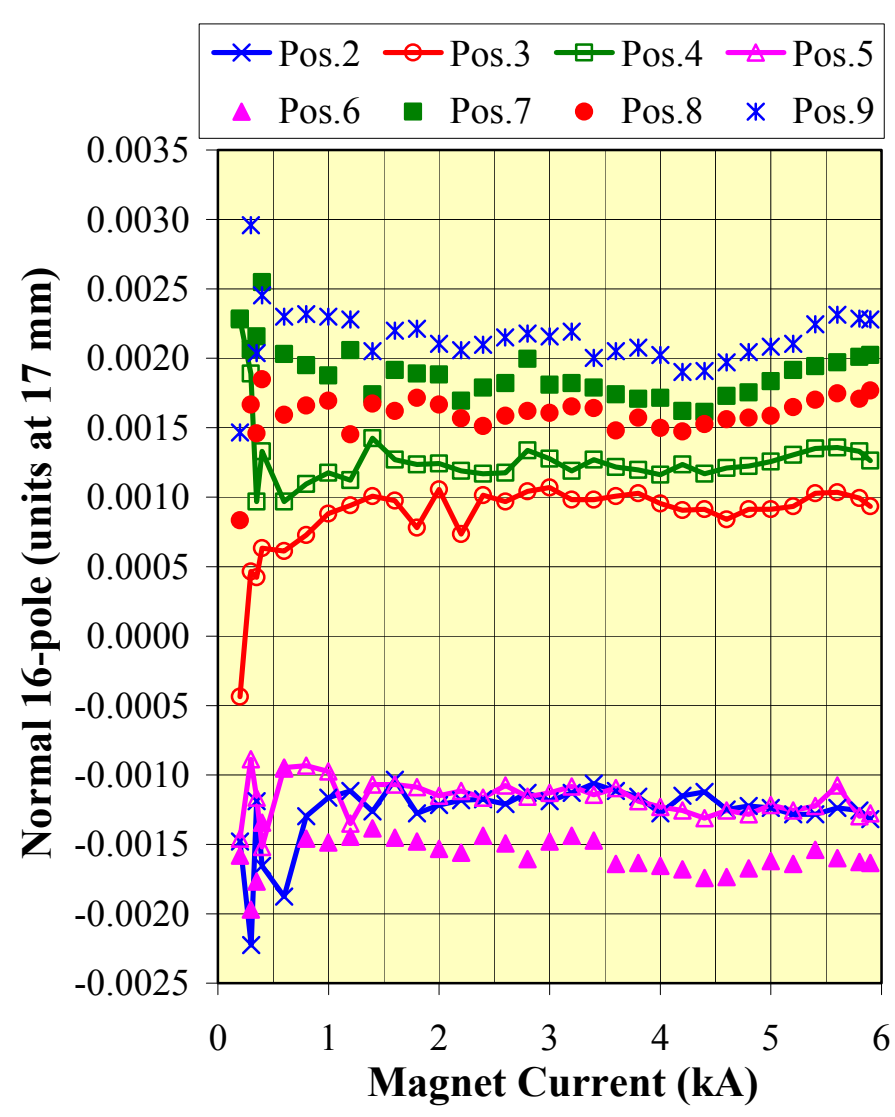


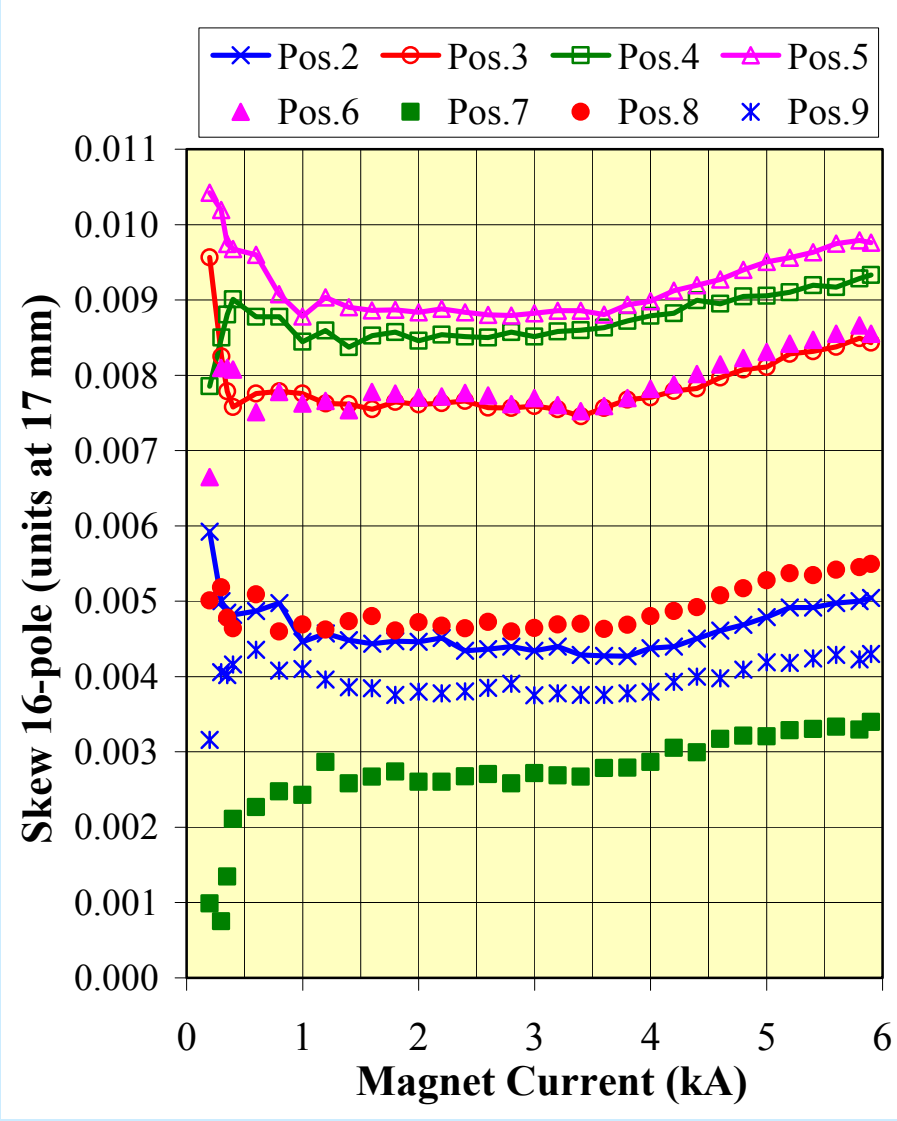
Excitation Curves in Straight Section of D1L103



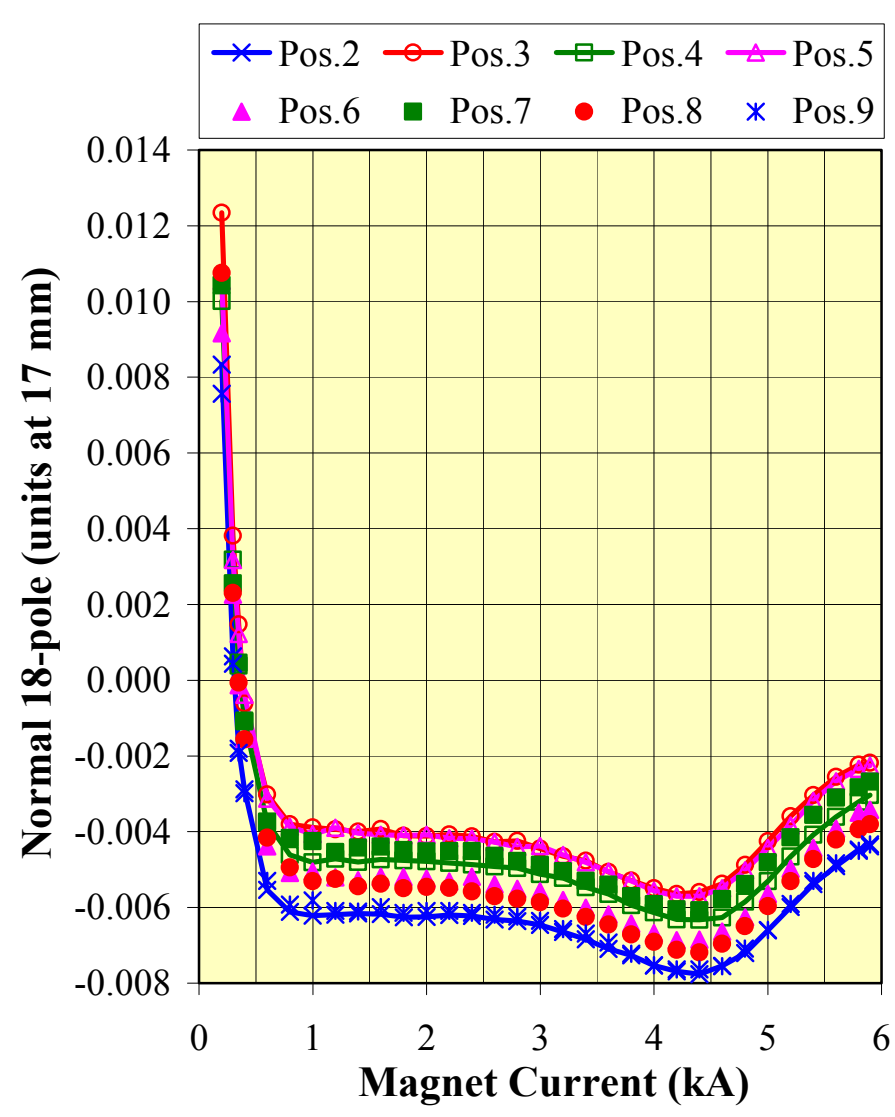


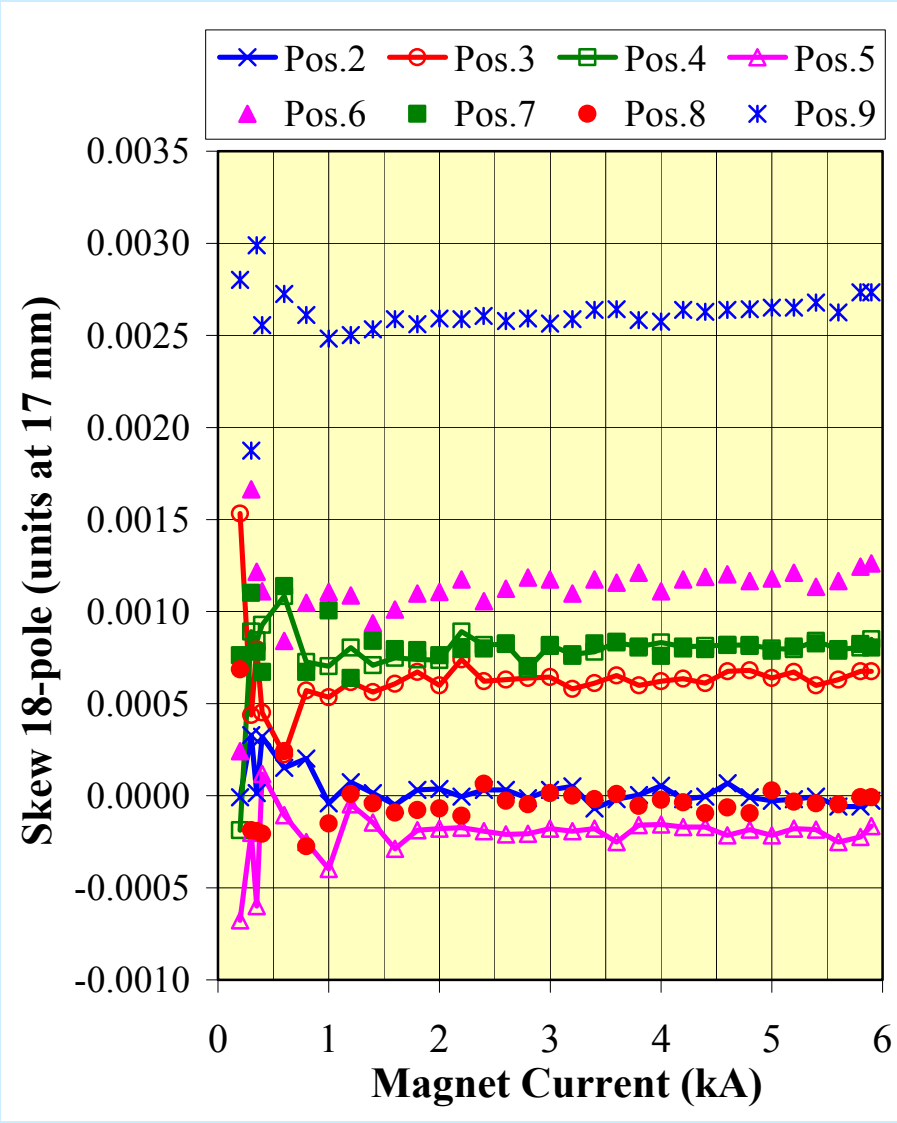
Excitation Curves in Straight Section of D1L103



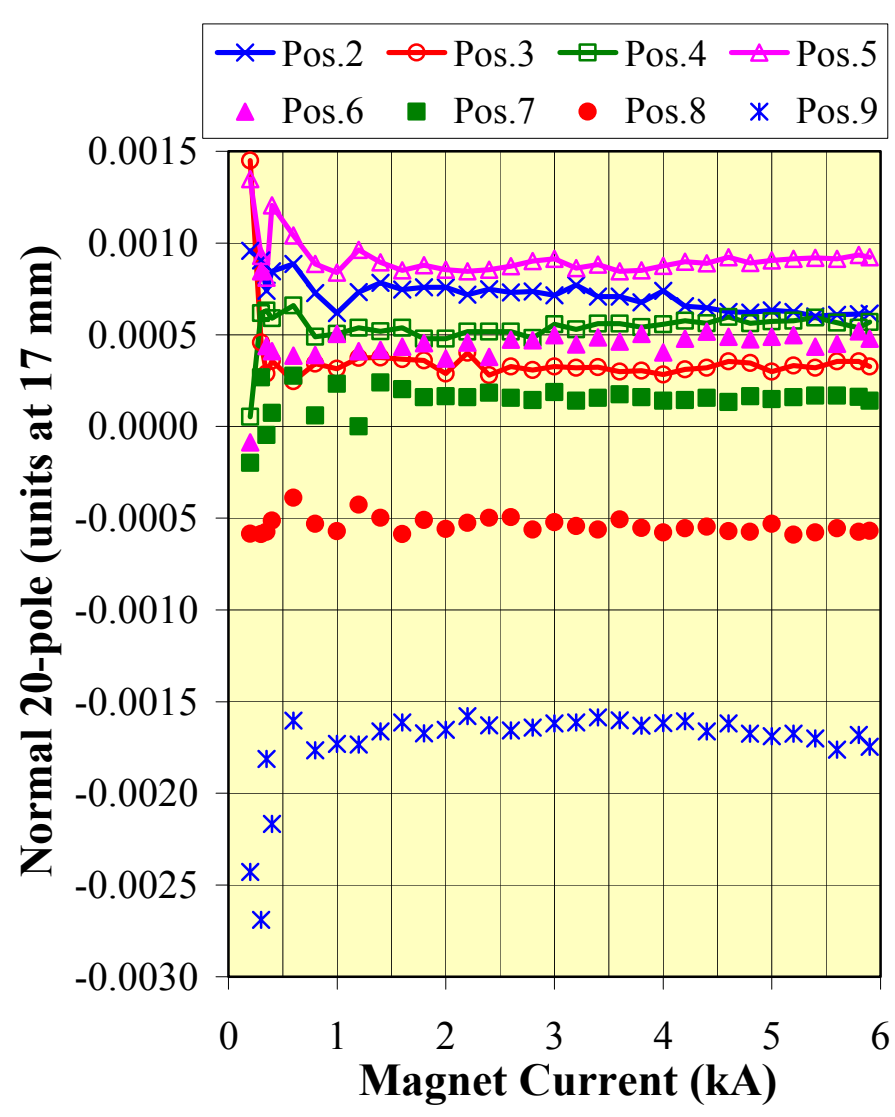


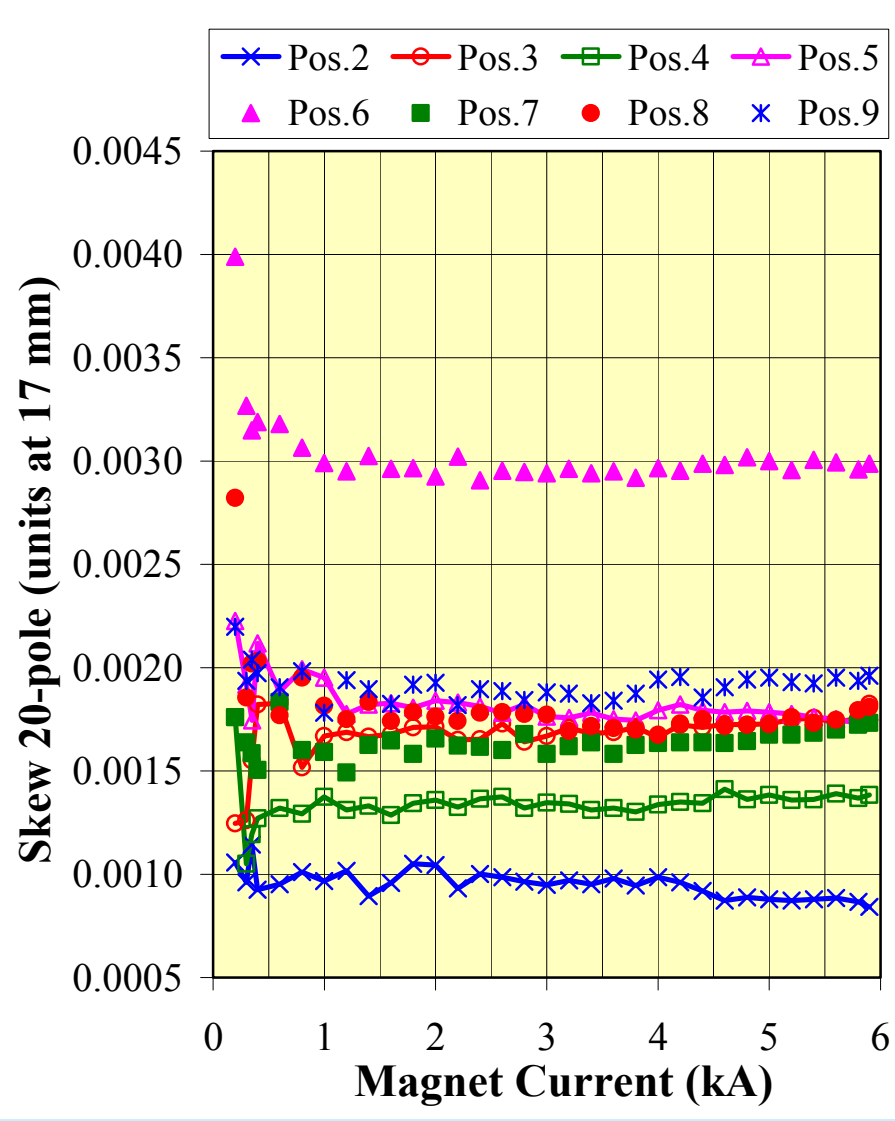
Excitation Curves in Straight Section of D1L103



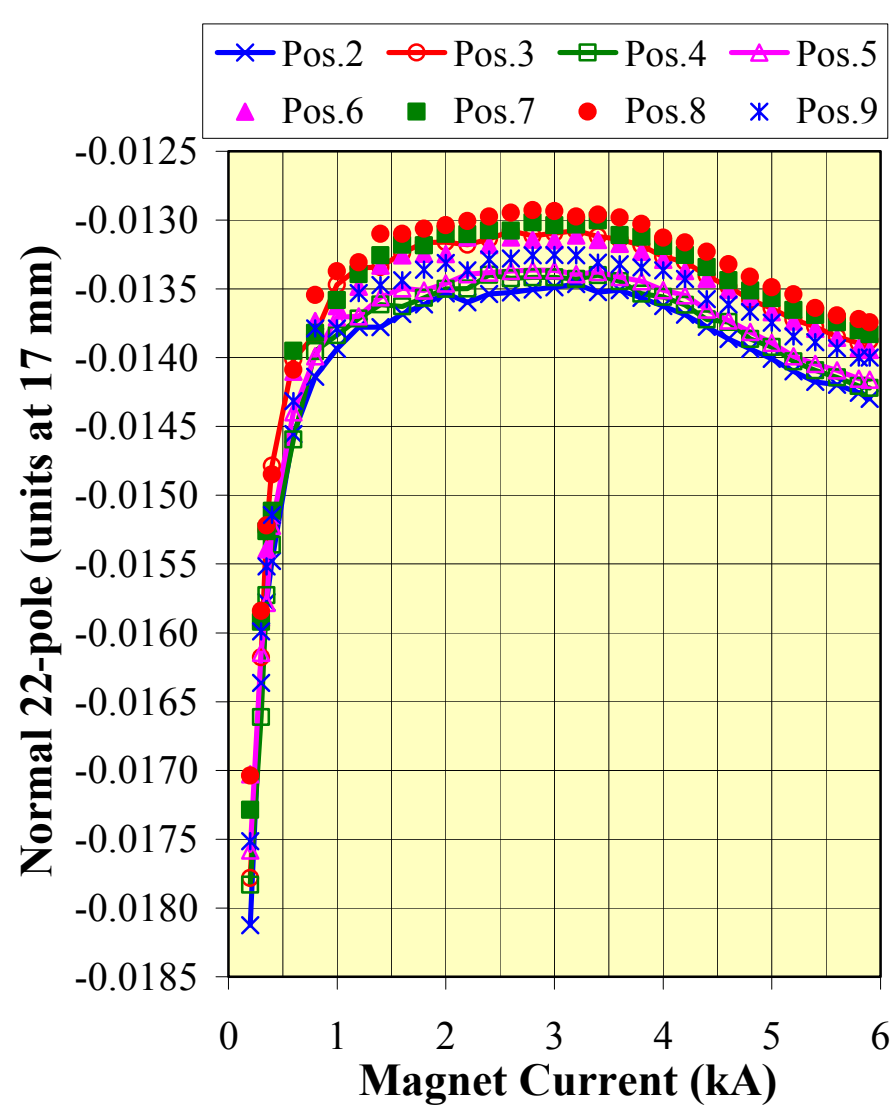


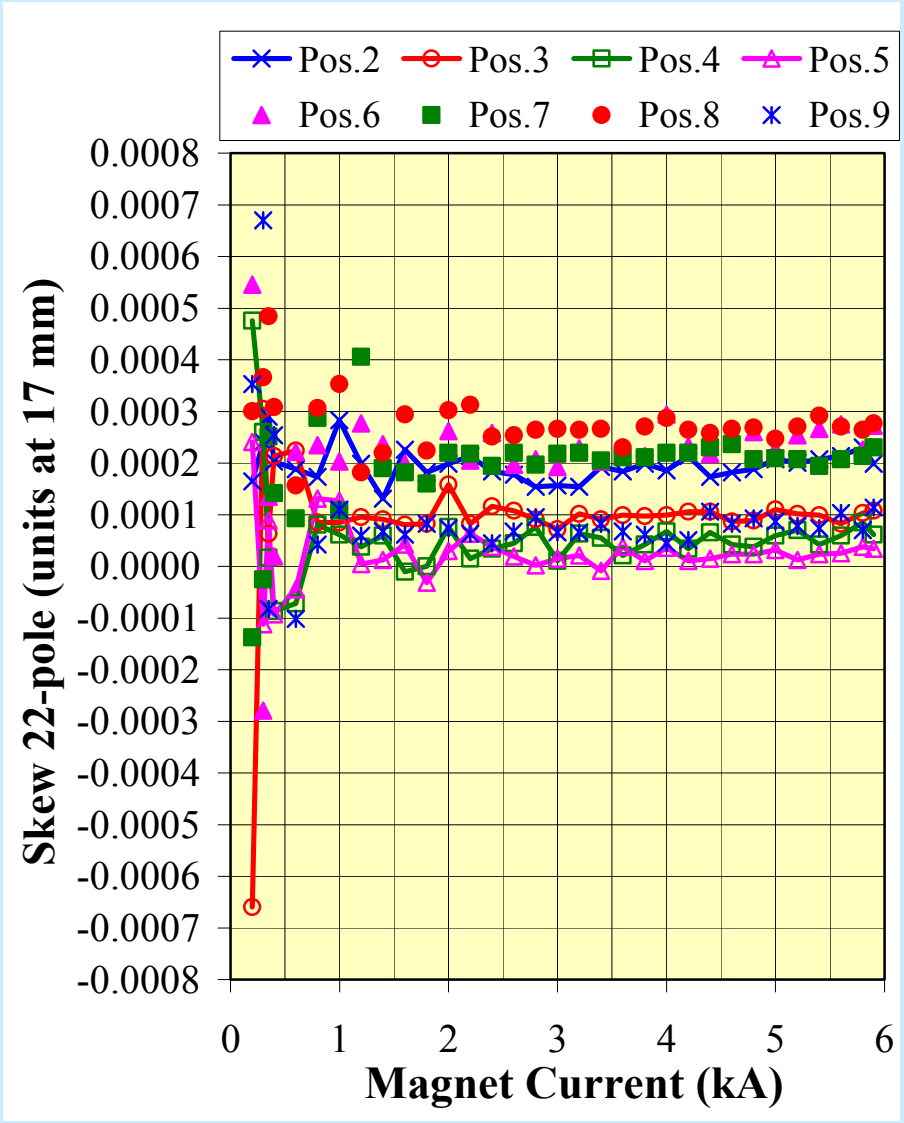
Excitation Curves in Straight Section of D1L103



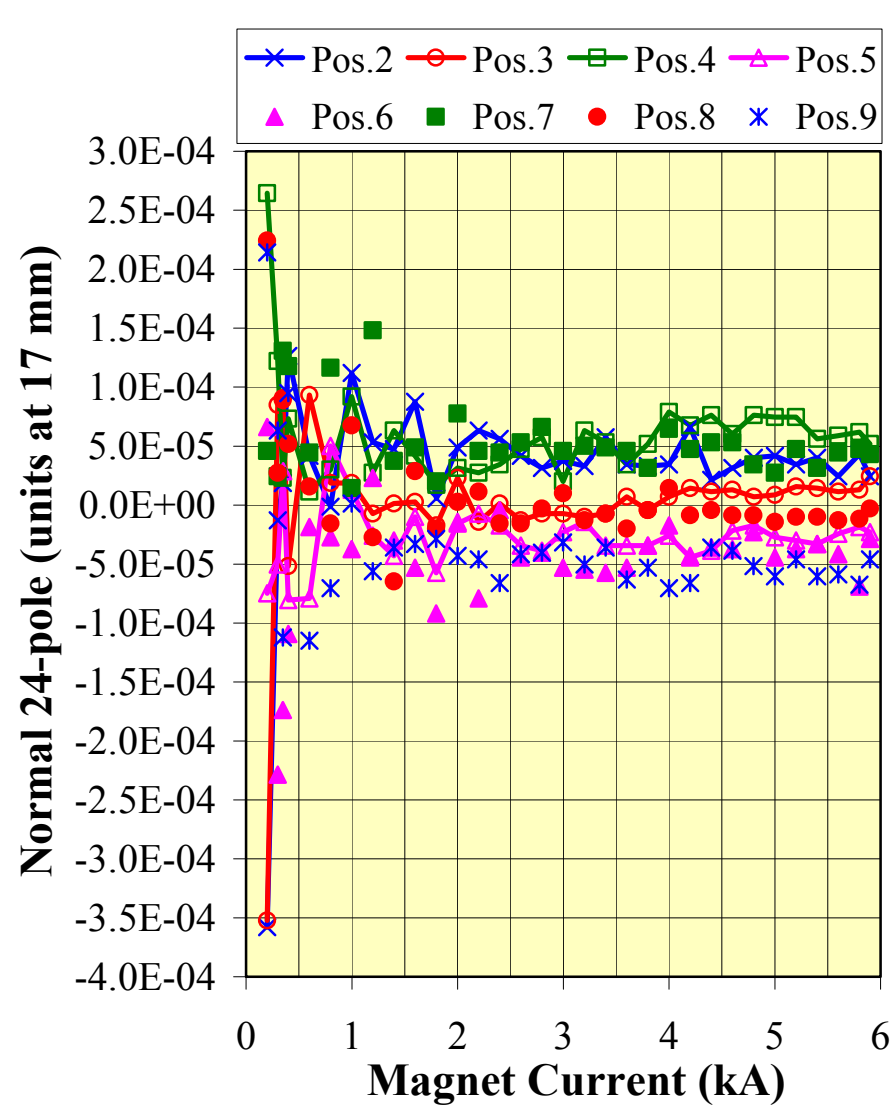


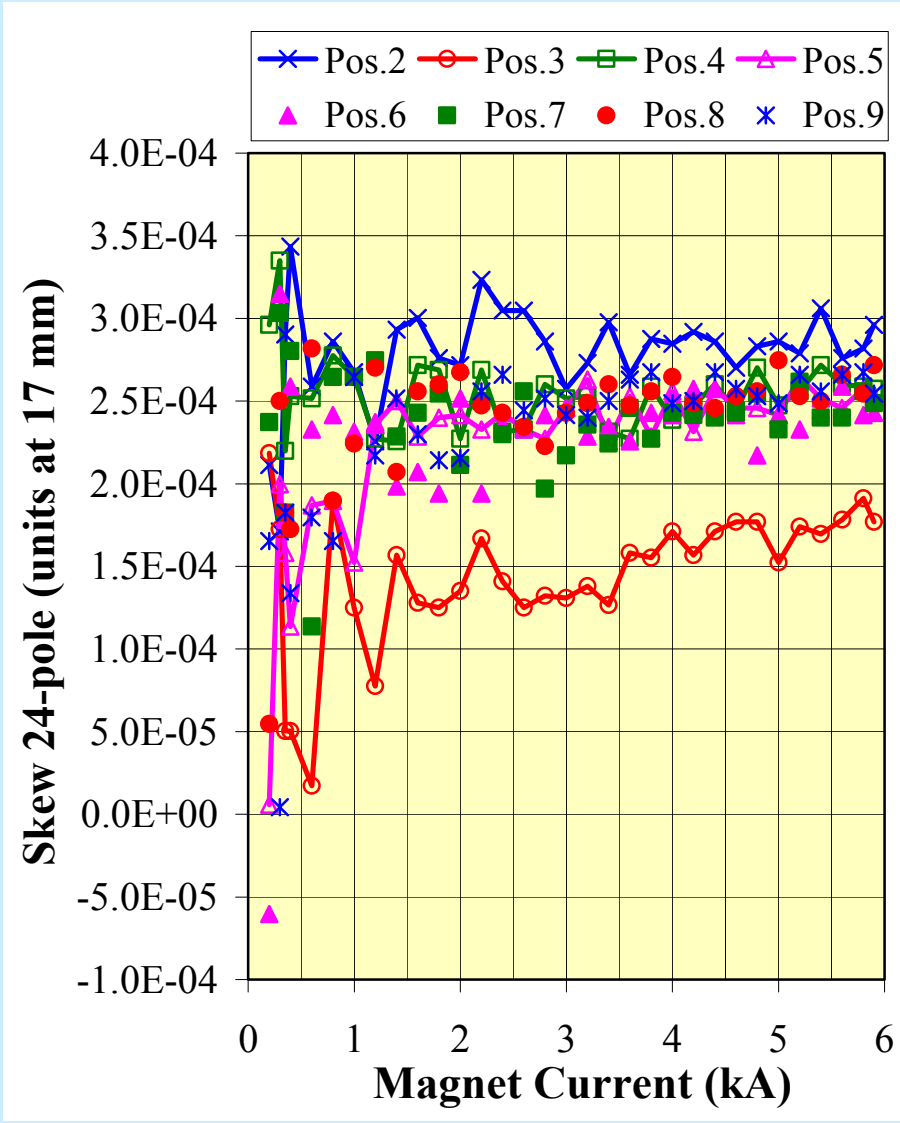
Excitation Curves in Straight Section of D1L103



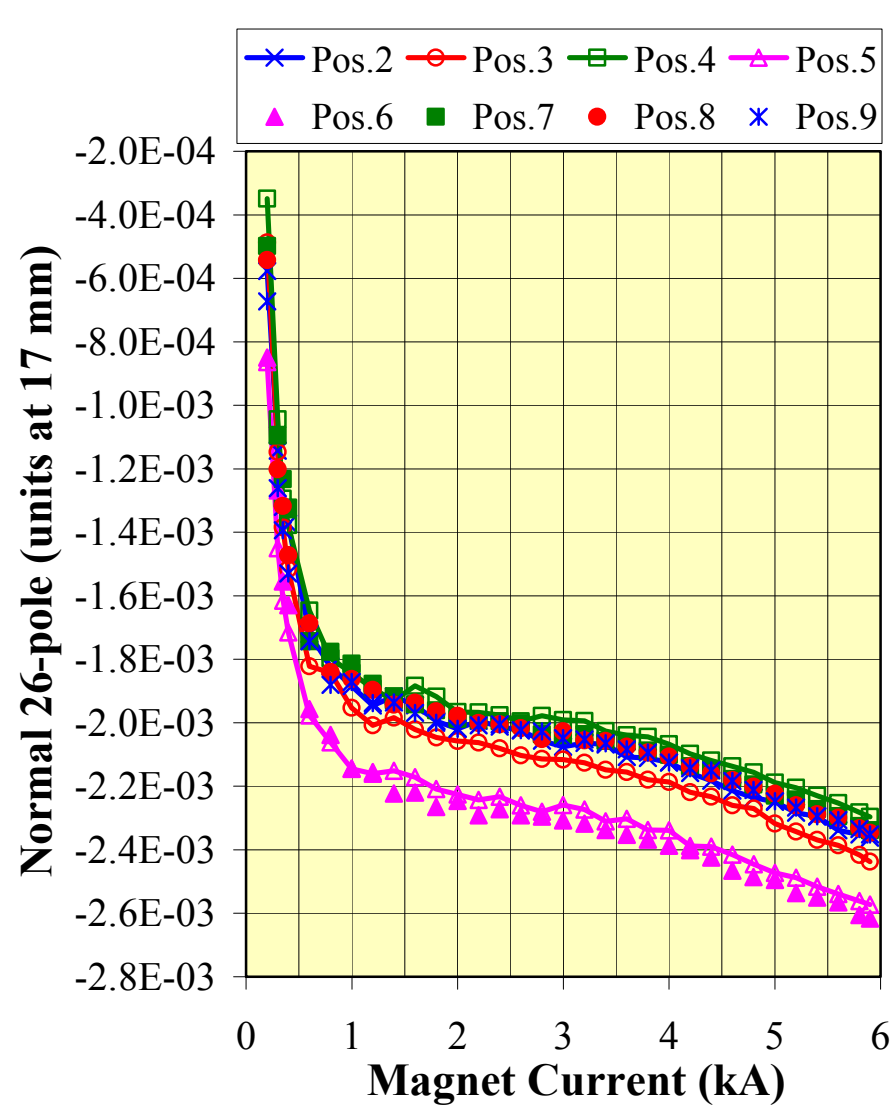


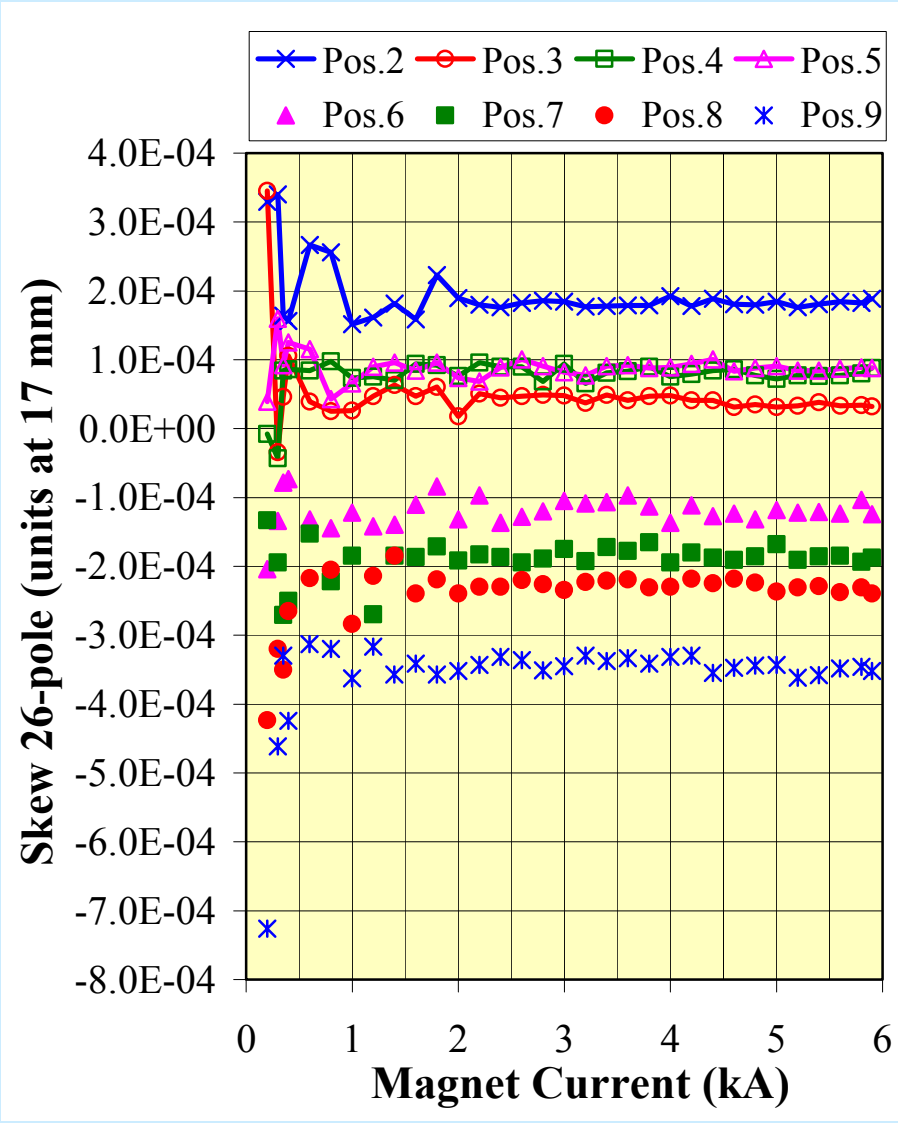
Excitation Curves in Straight Section of D1L103



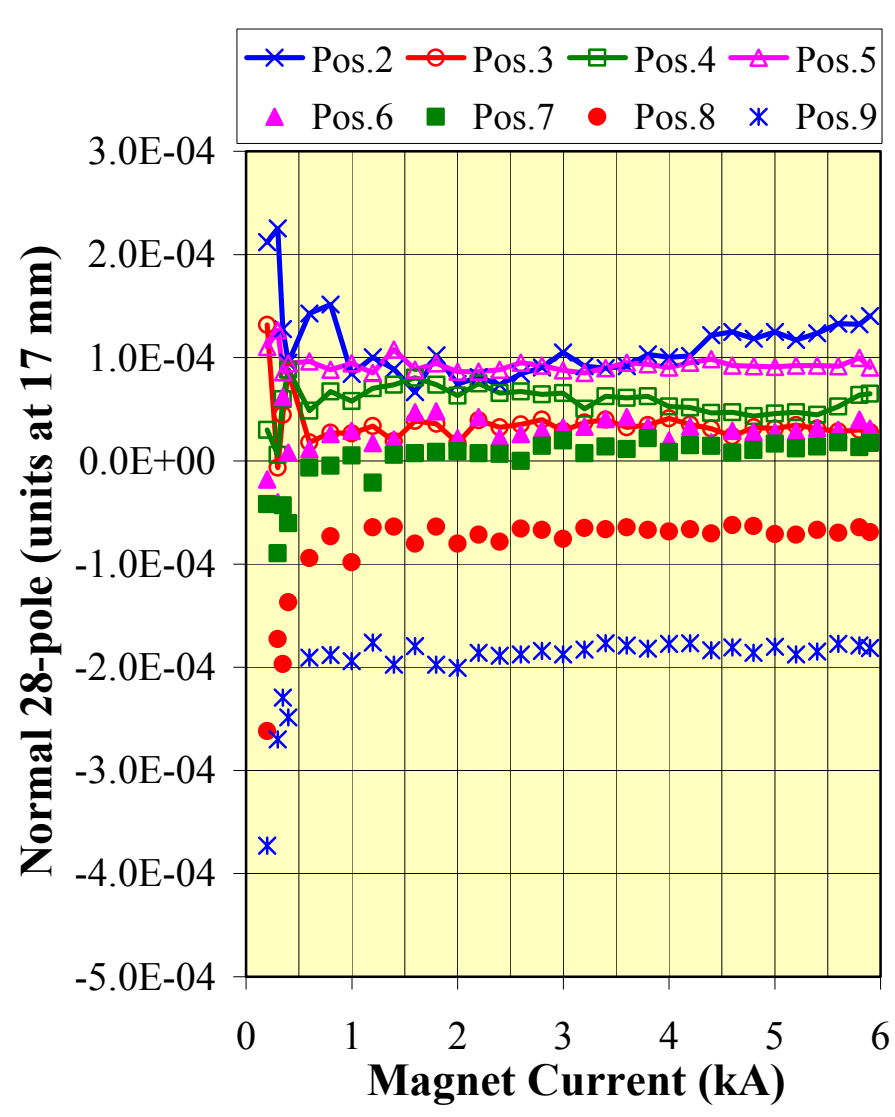


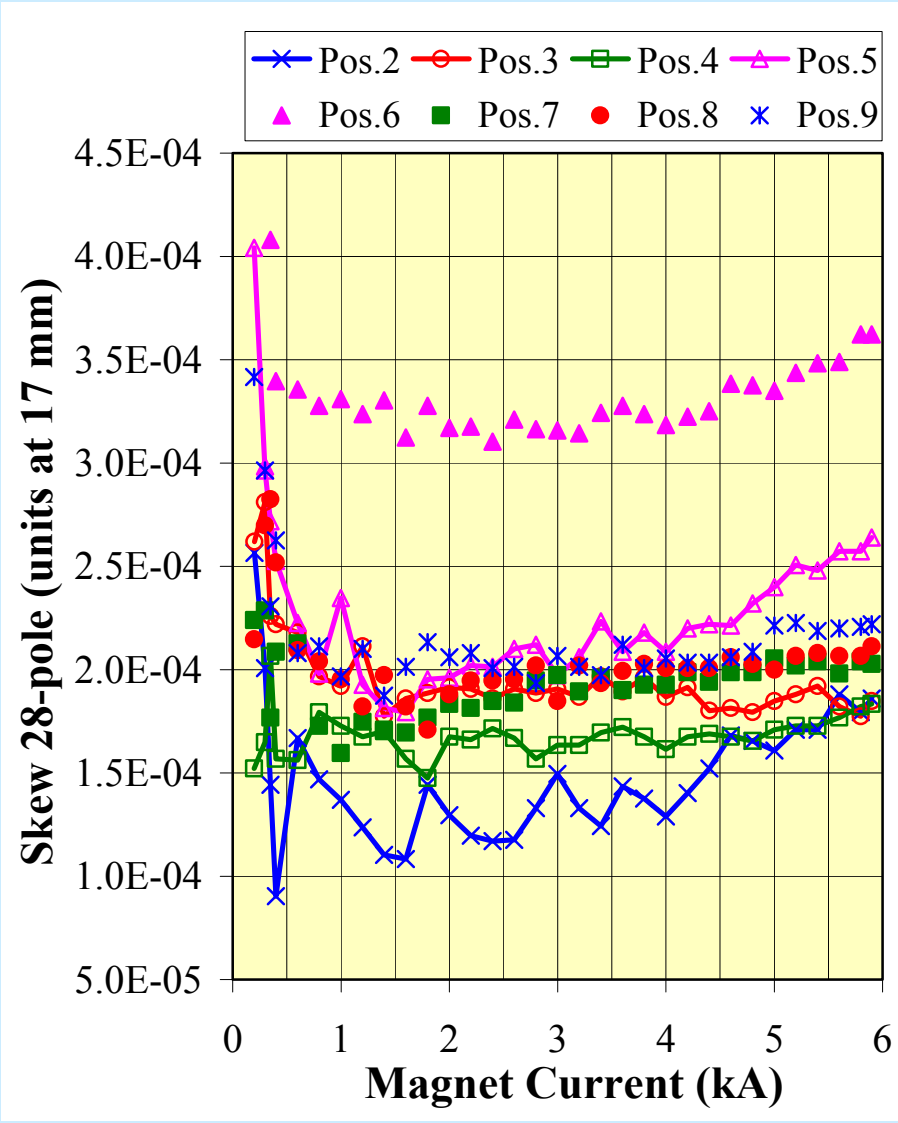
Excitation Curves in Straight Section of D1L103



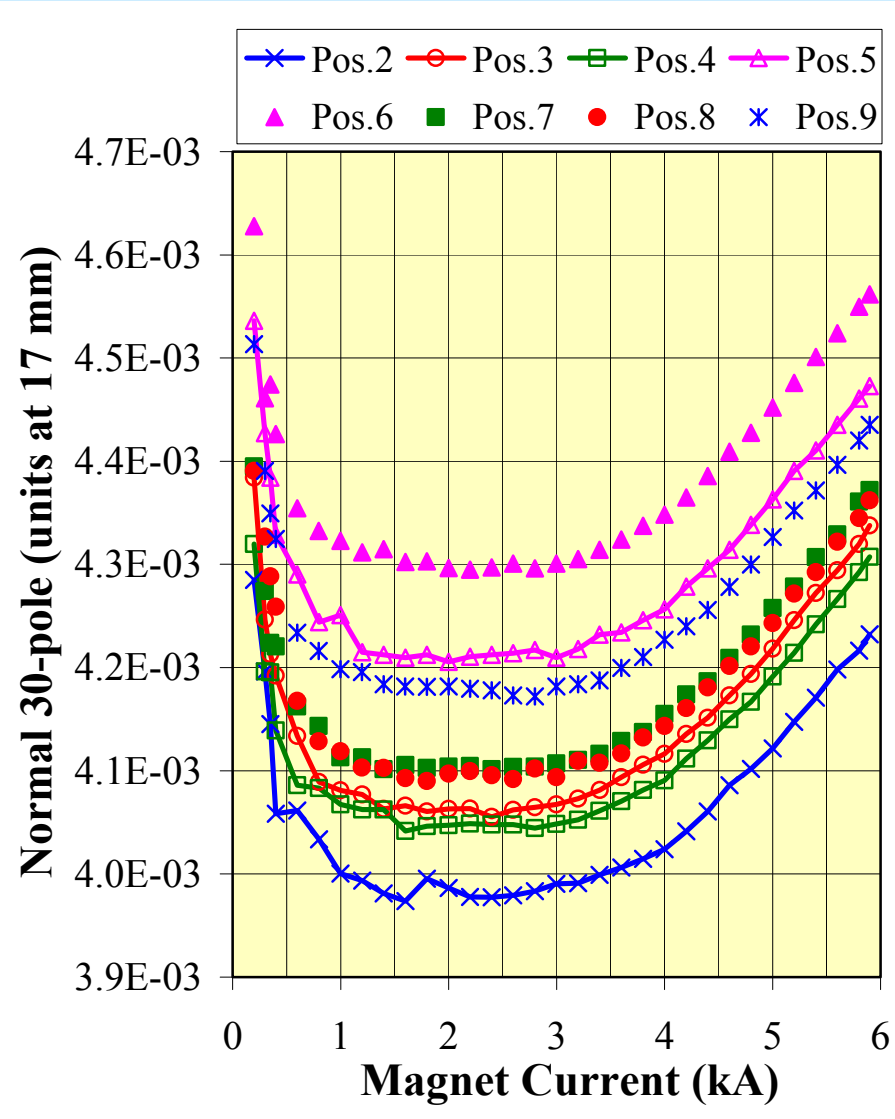


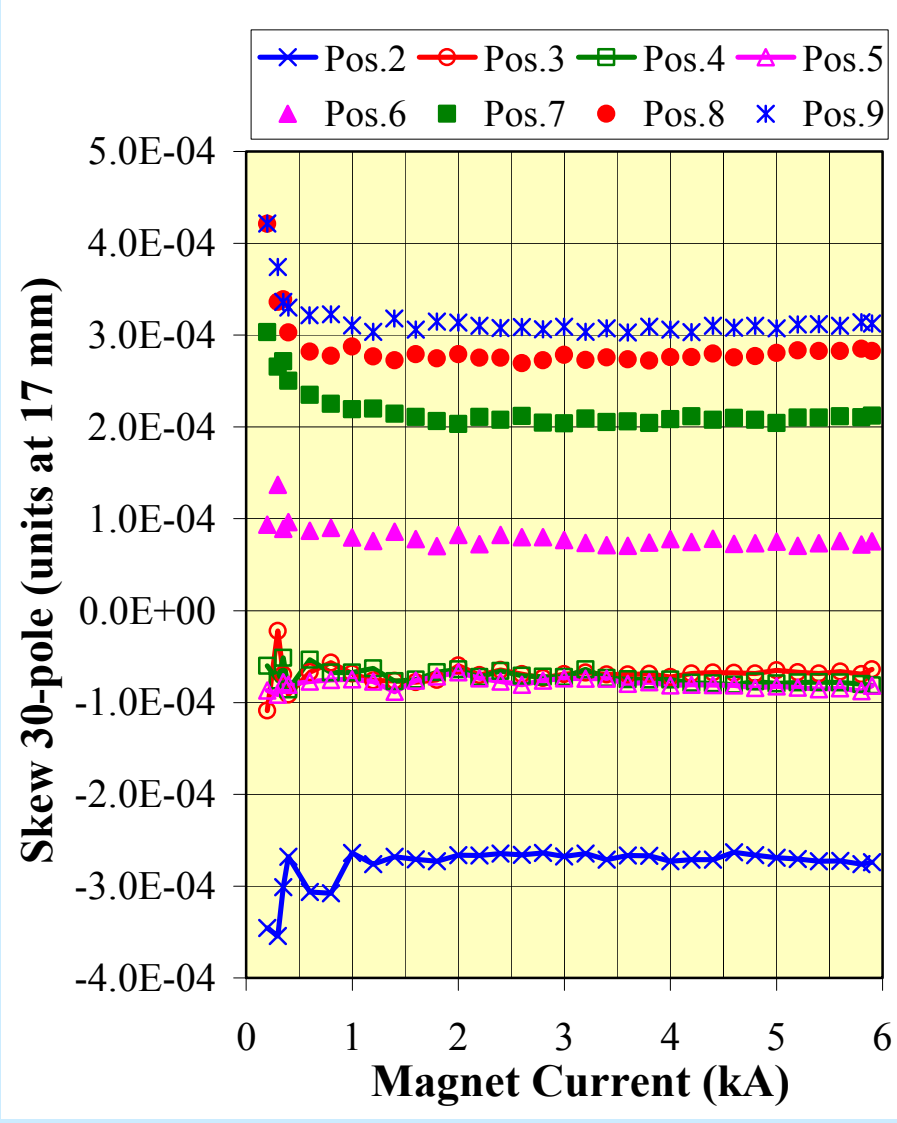
Excitation Curves in Straight Section of D1L103





Excitation Curves in Straight Section of D1L103

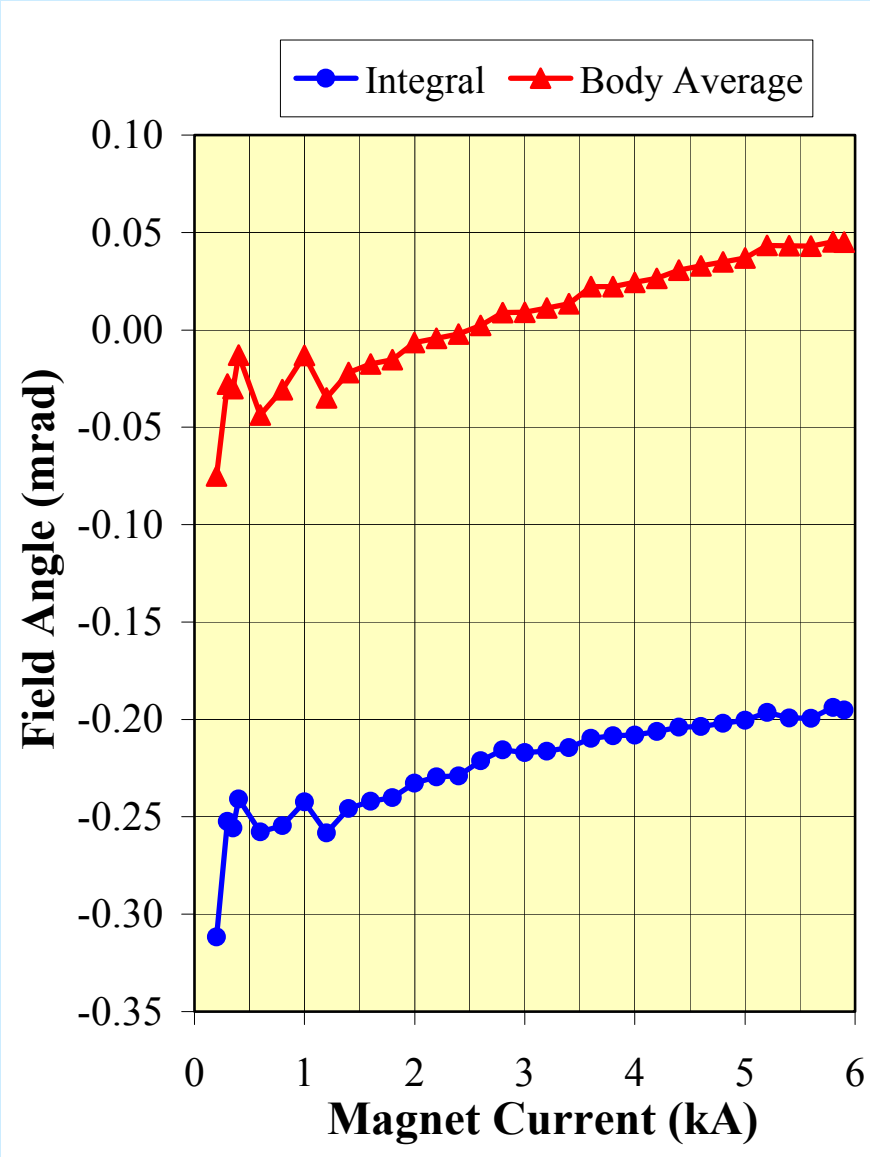


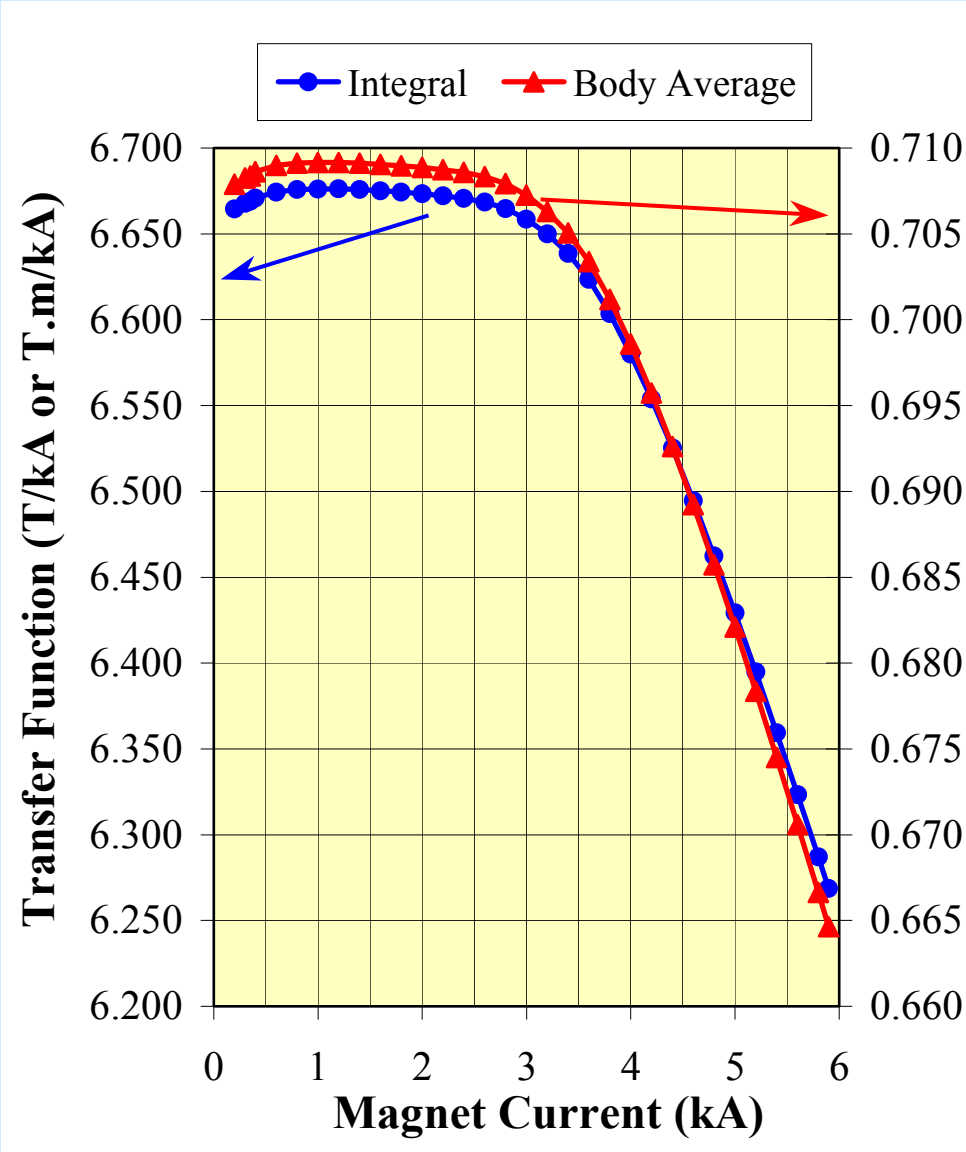


Integral and Body Harmonics as a Function of Current

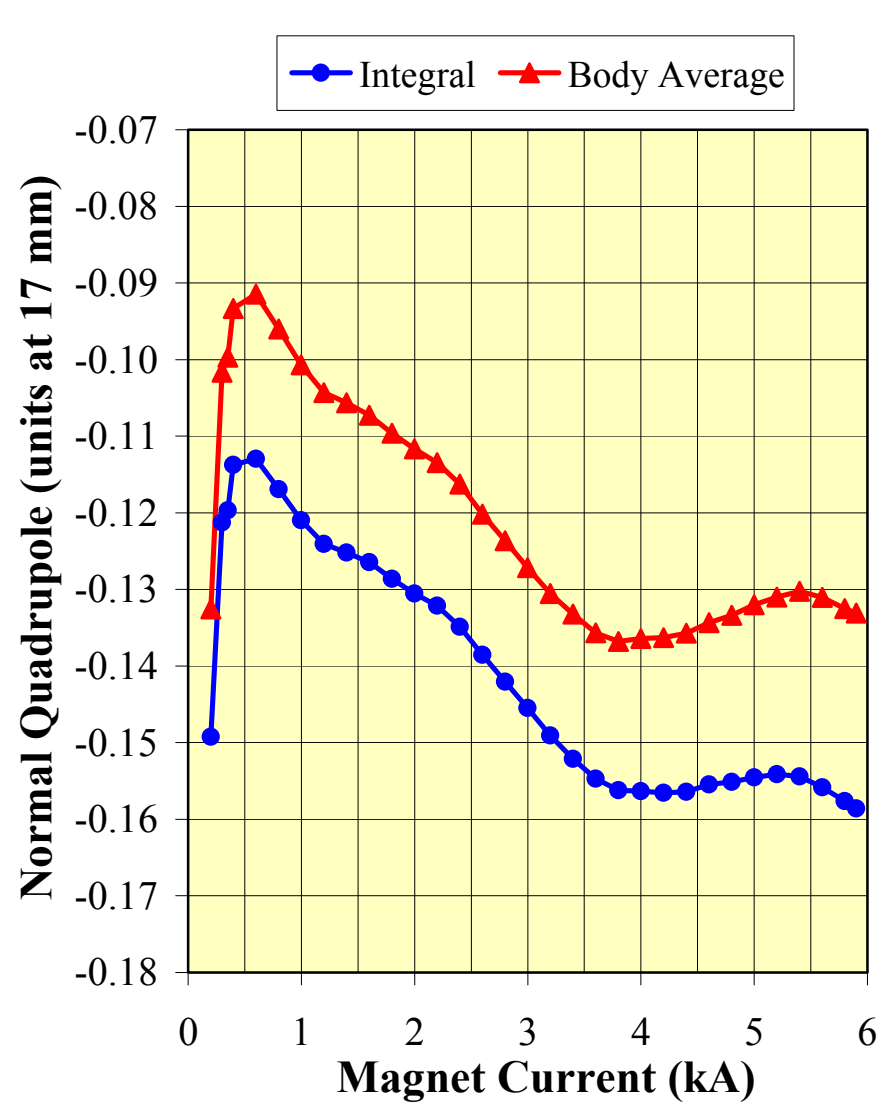
(Derived from multiple measurements)

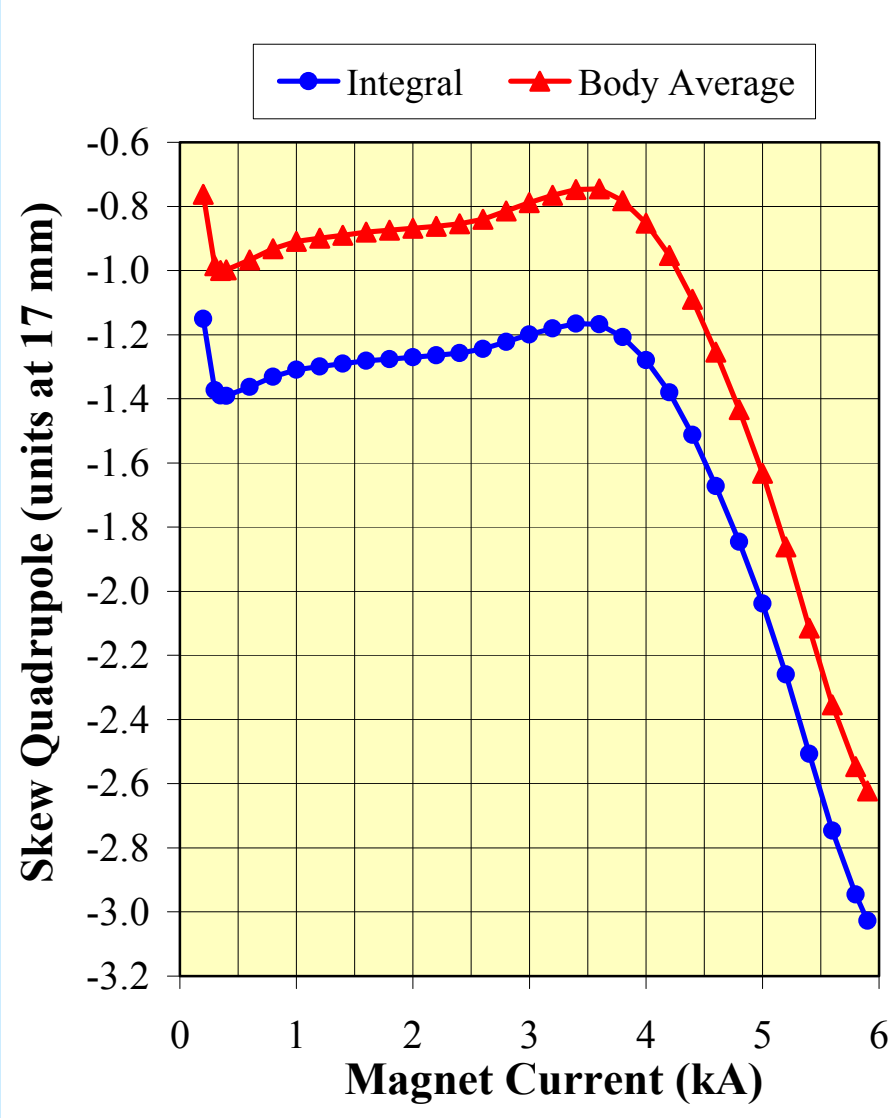
Integral and St. Section Field Quality in D1L103



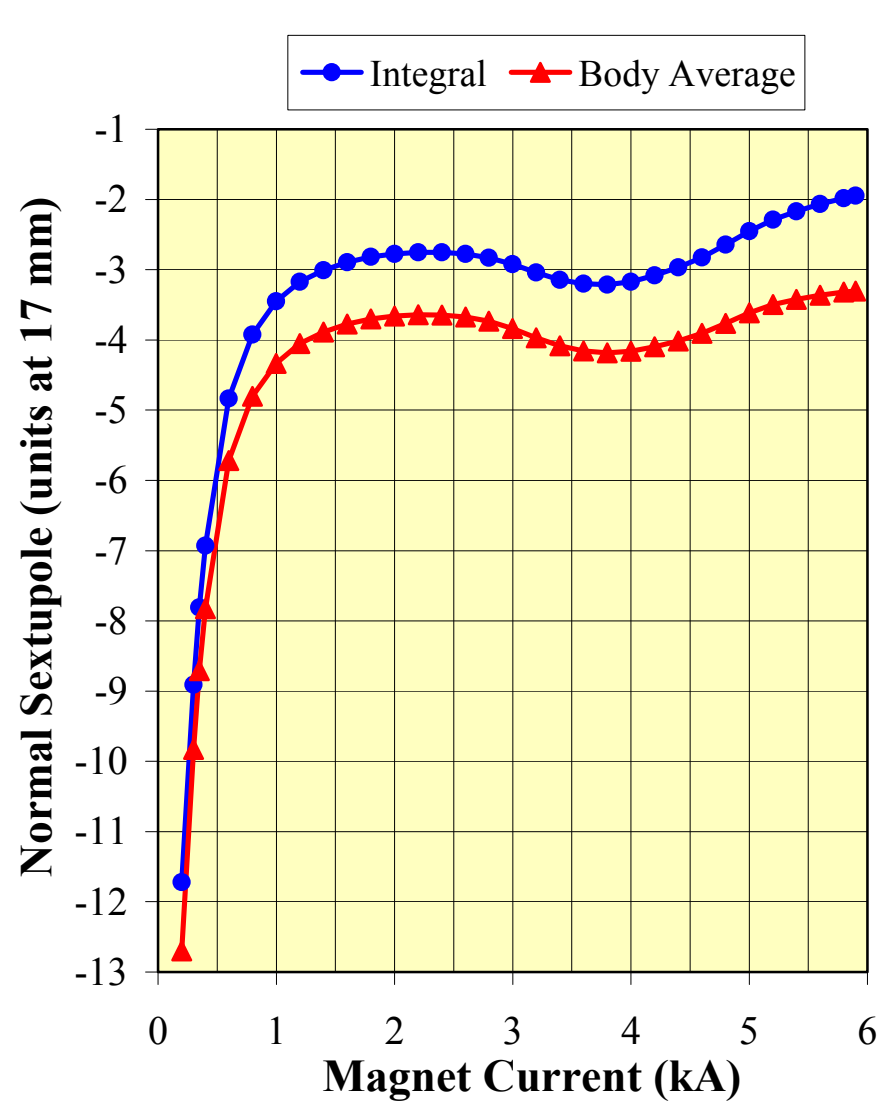


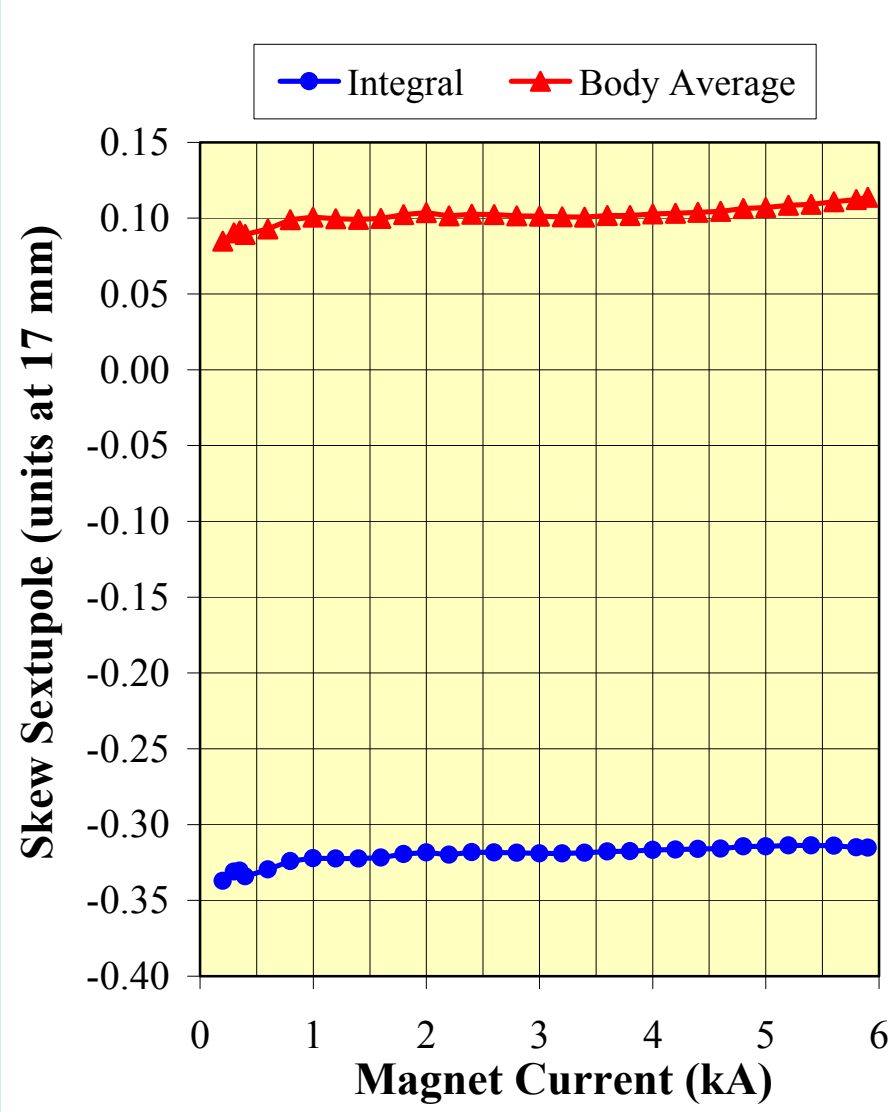
Integral and St. Section Field Quality in D1L103



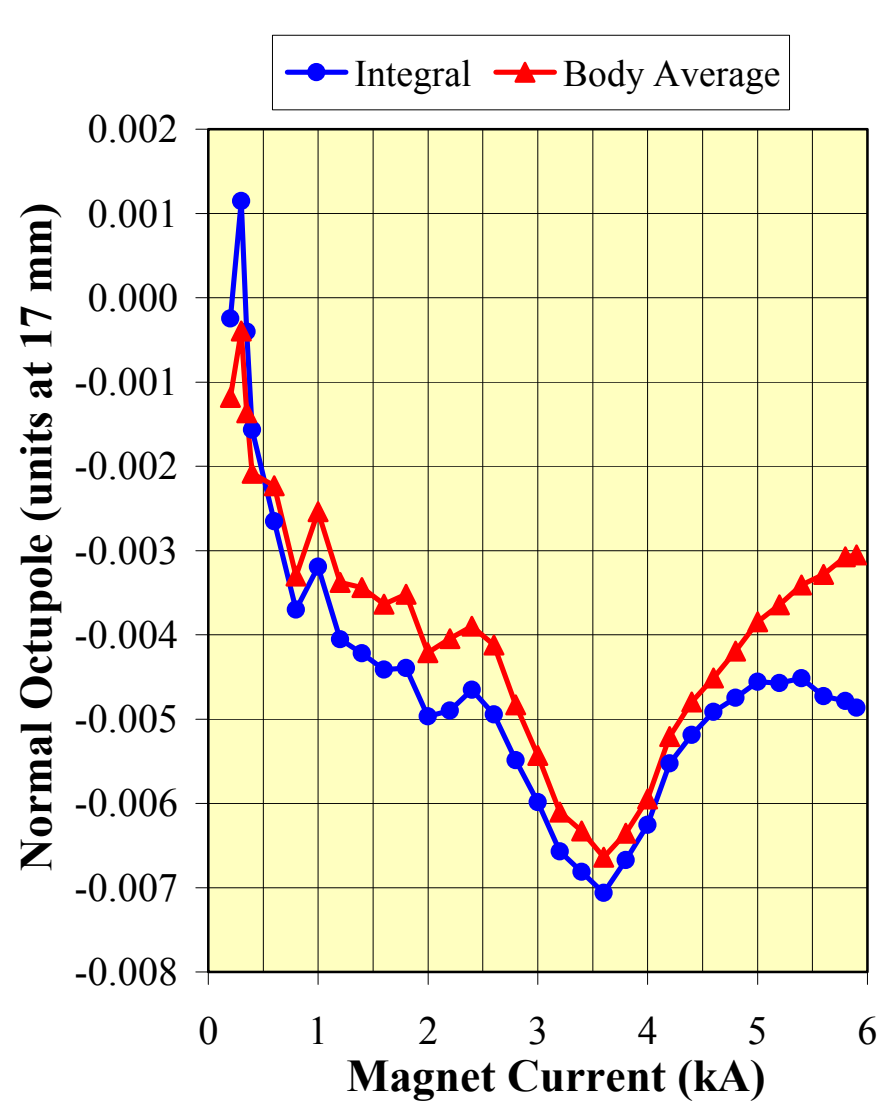


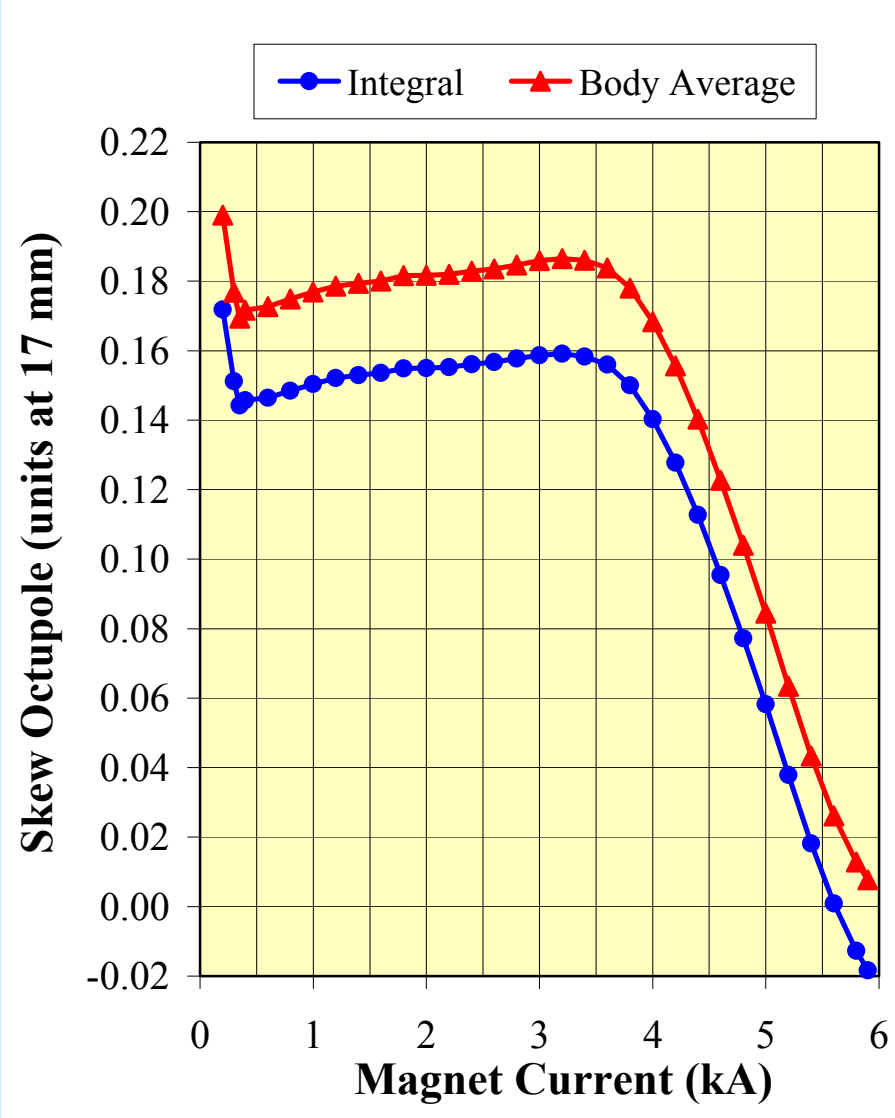
Integral and St. Section Field Quality in D1L103



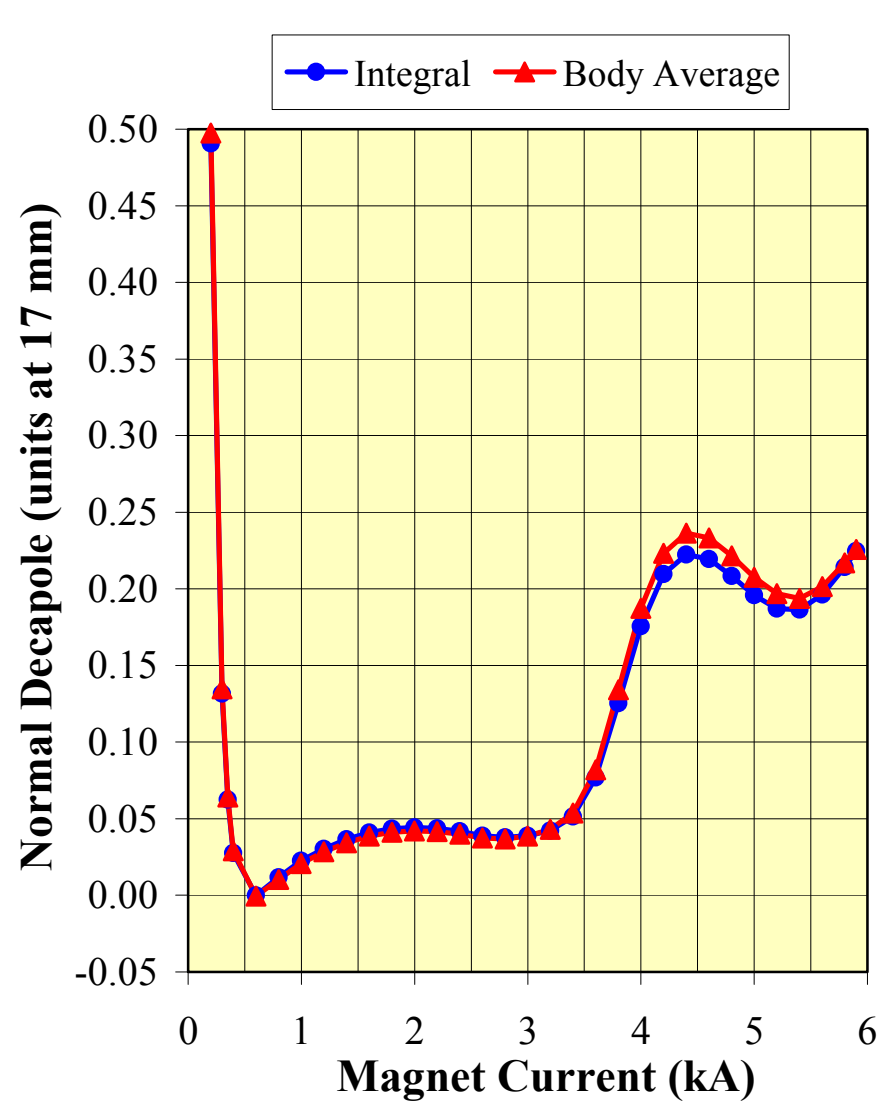


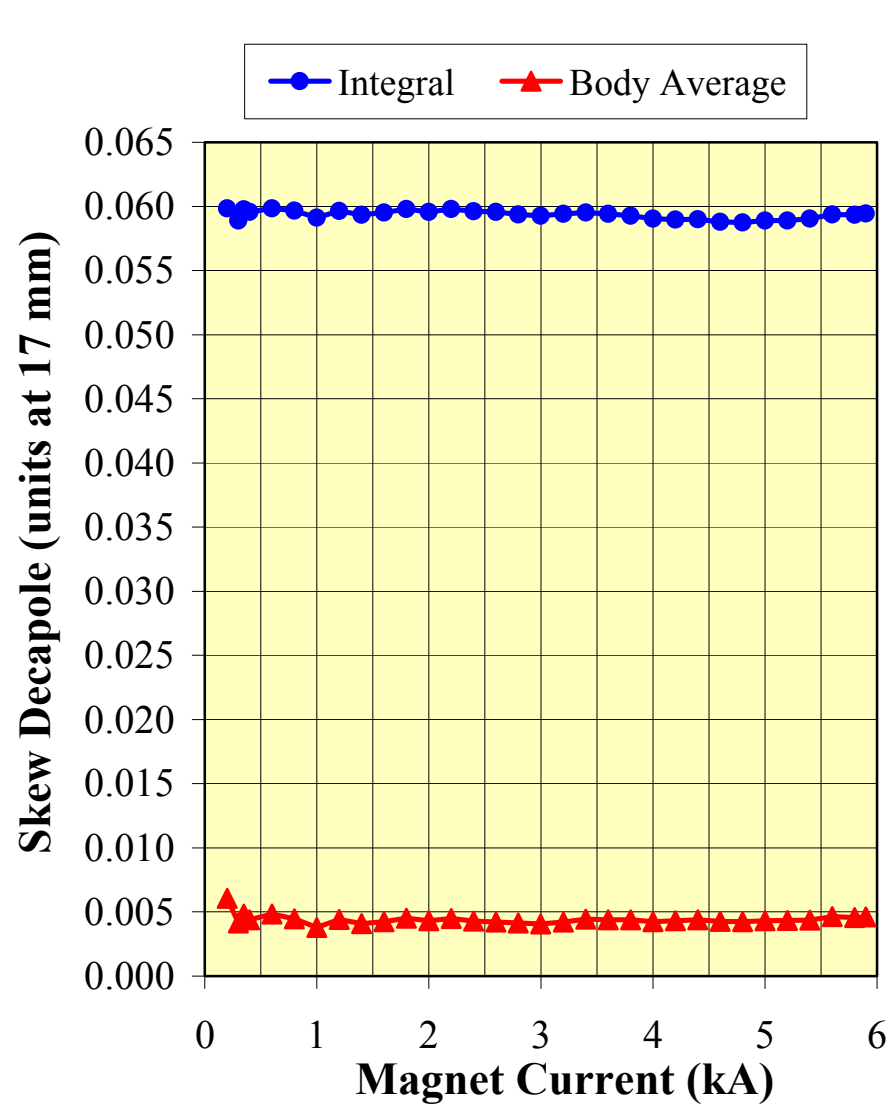
Integral and St. Section Field Quality in D1L103



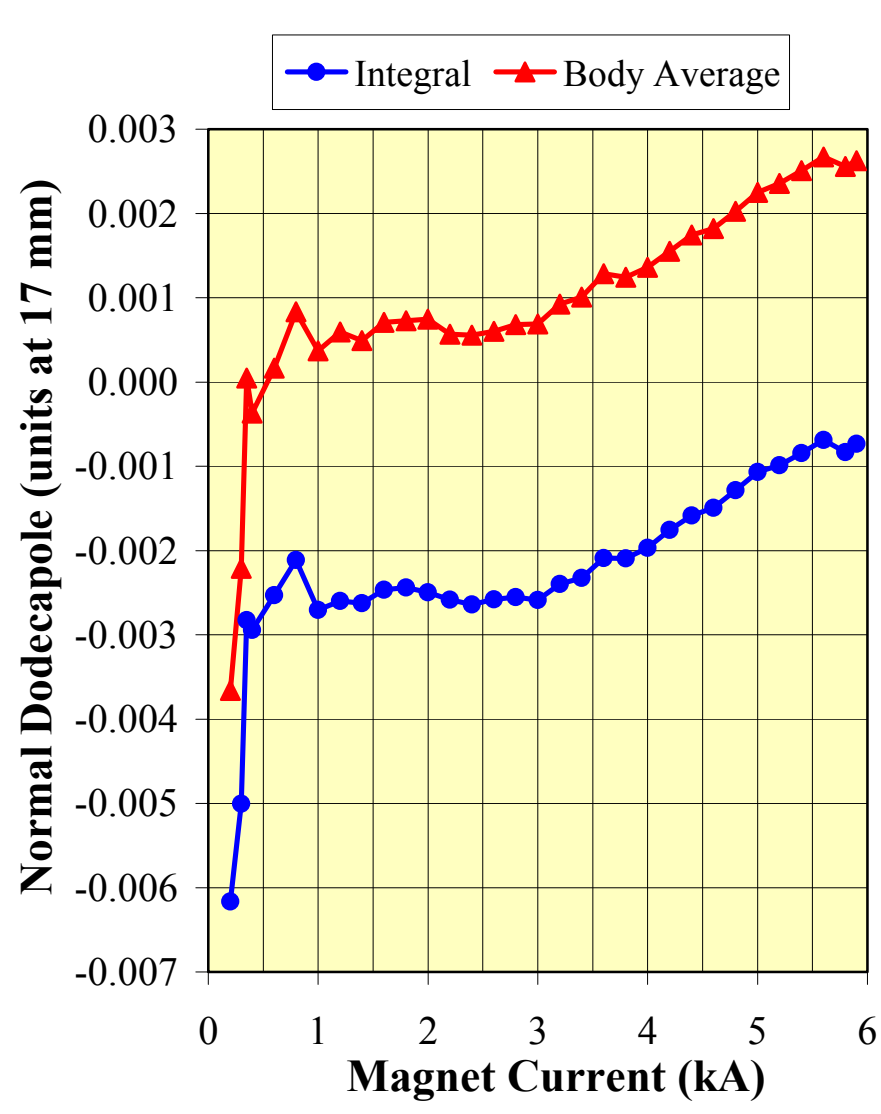


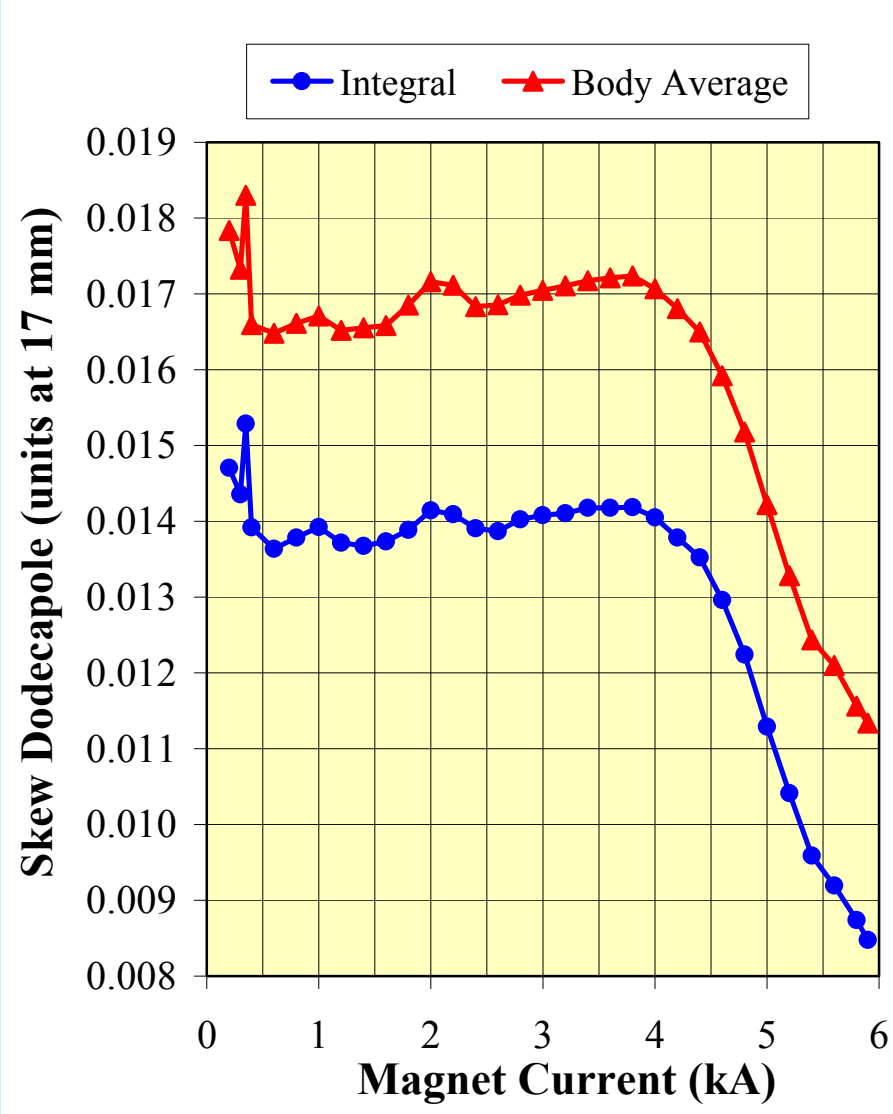
Integral and St. Section Field Quality in D1L103



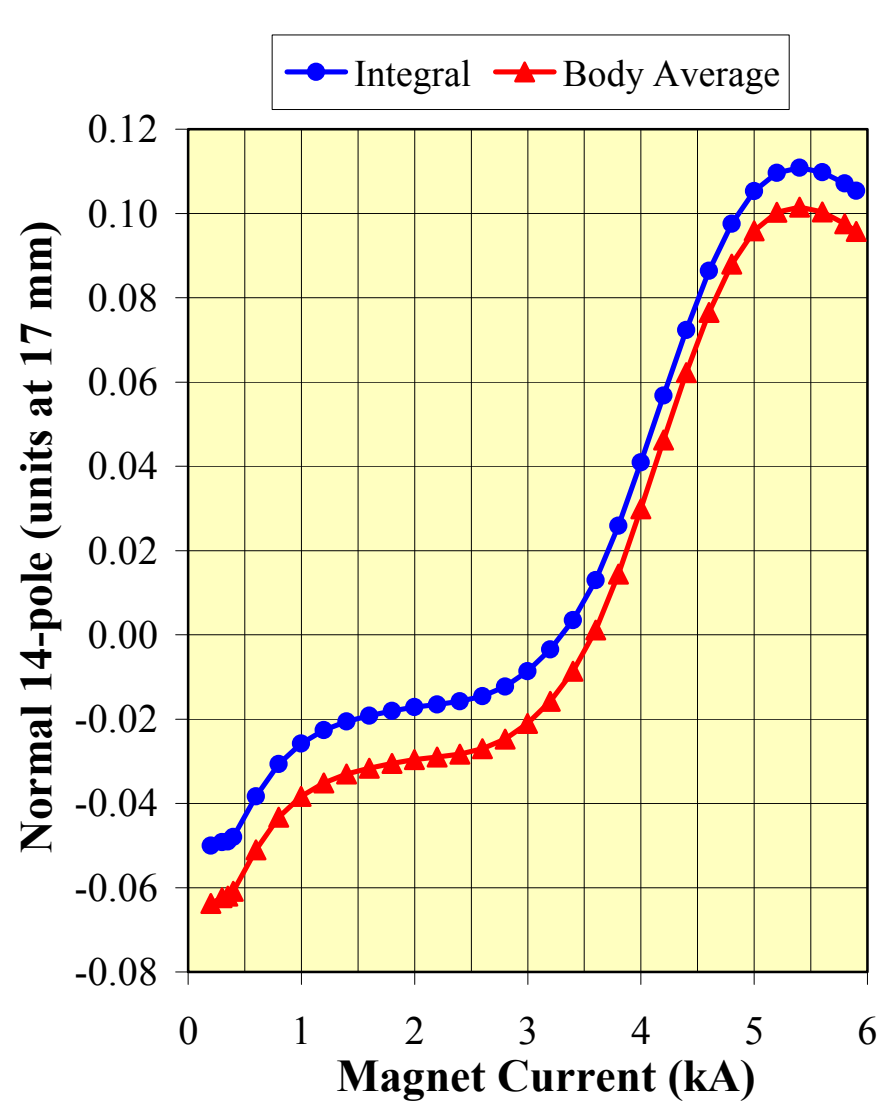


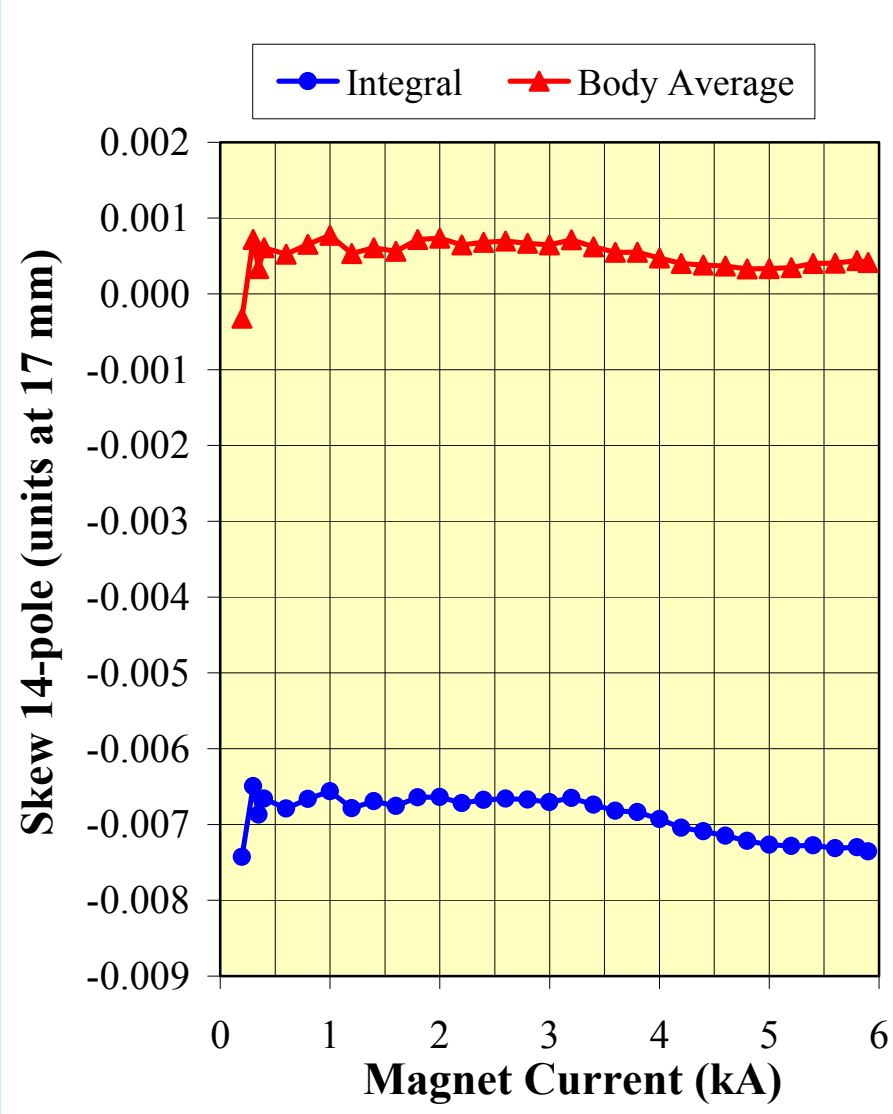
Integral and St. Section Field Quality in D1L103



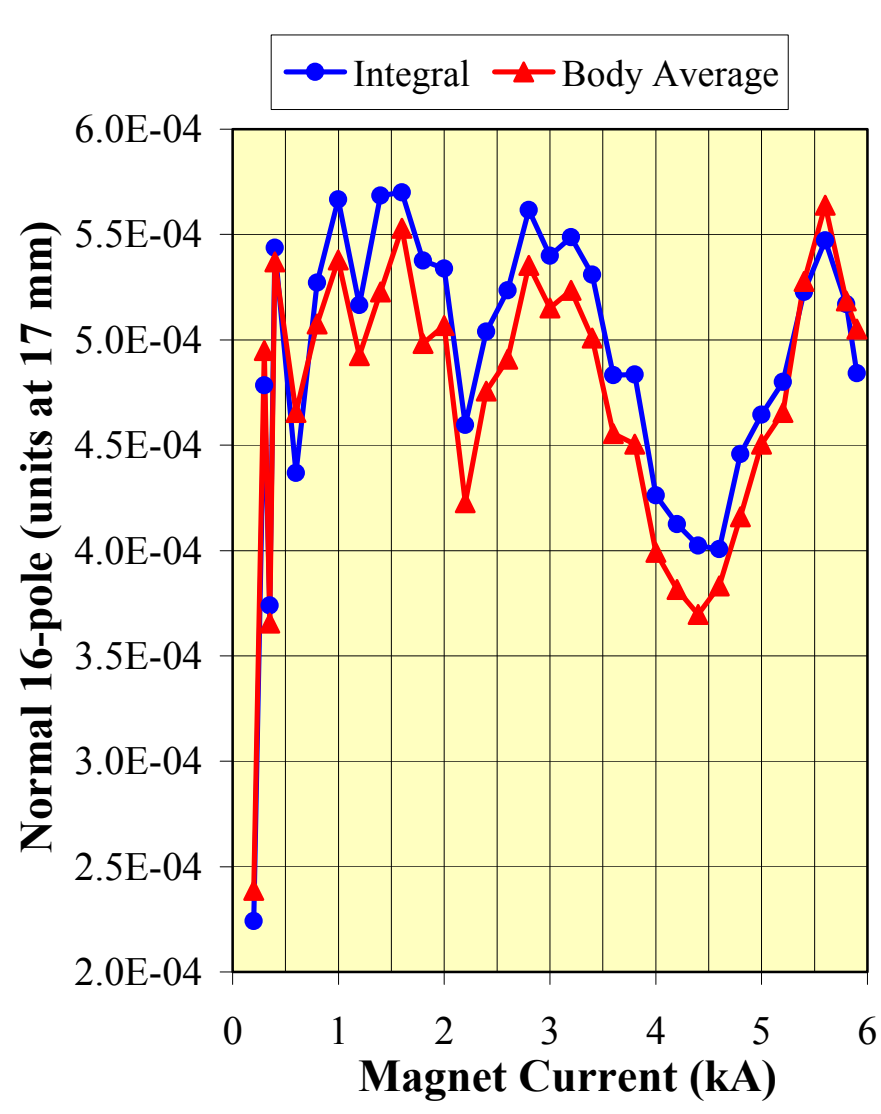


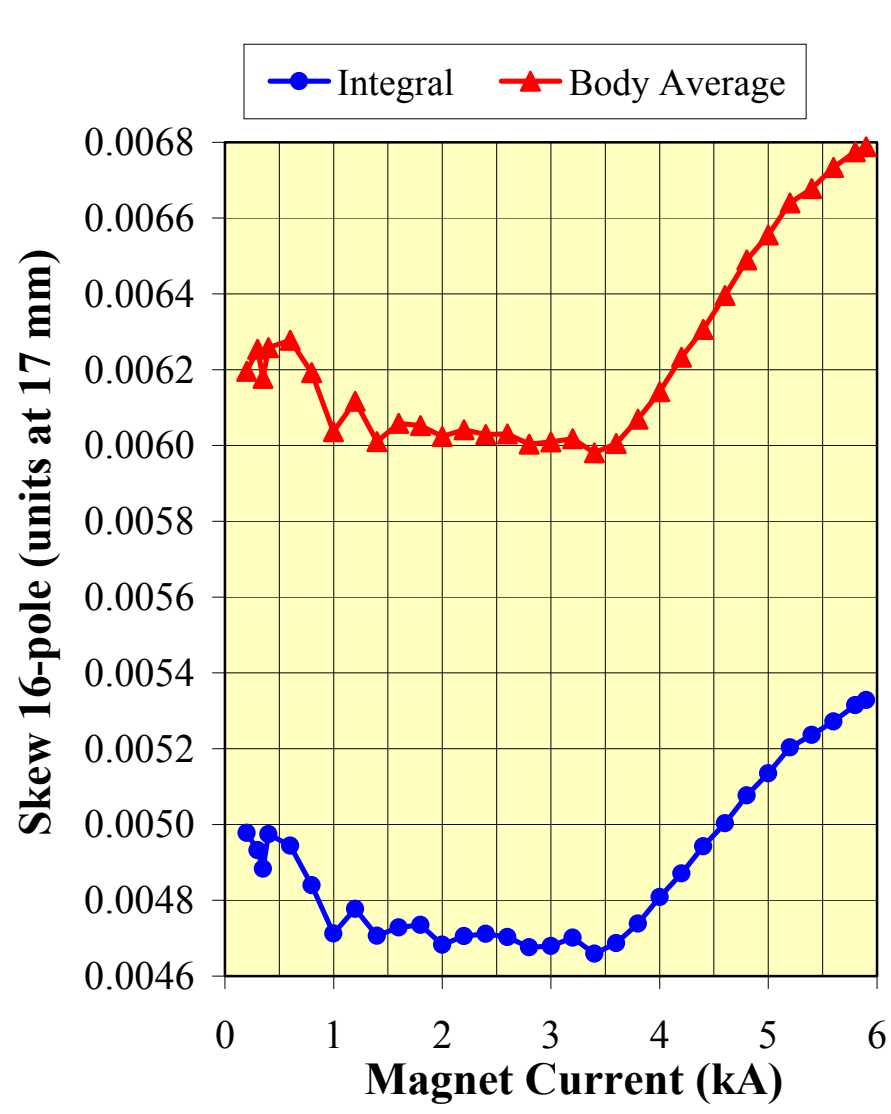
Integral and St. Section Field Quality in D1L103



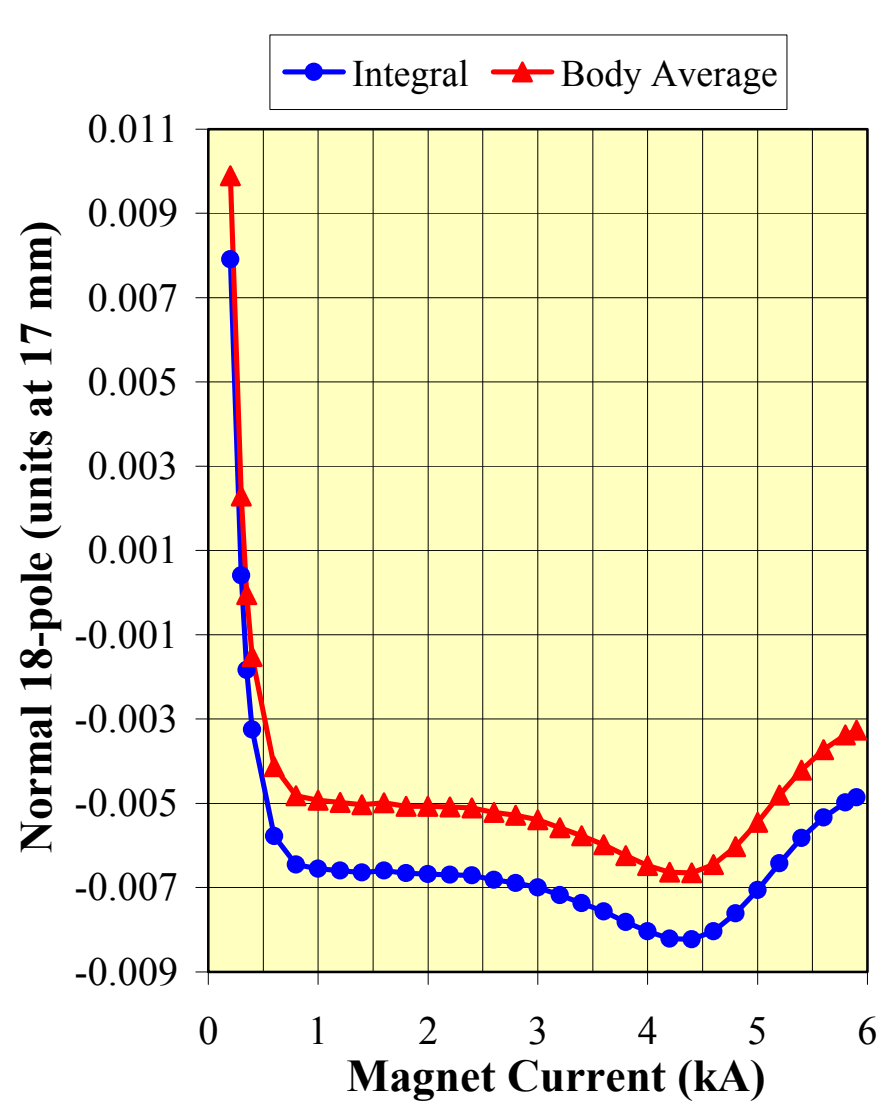


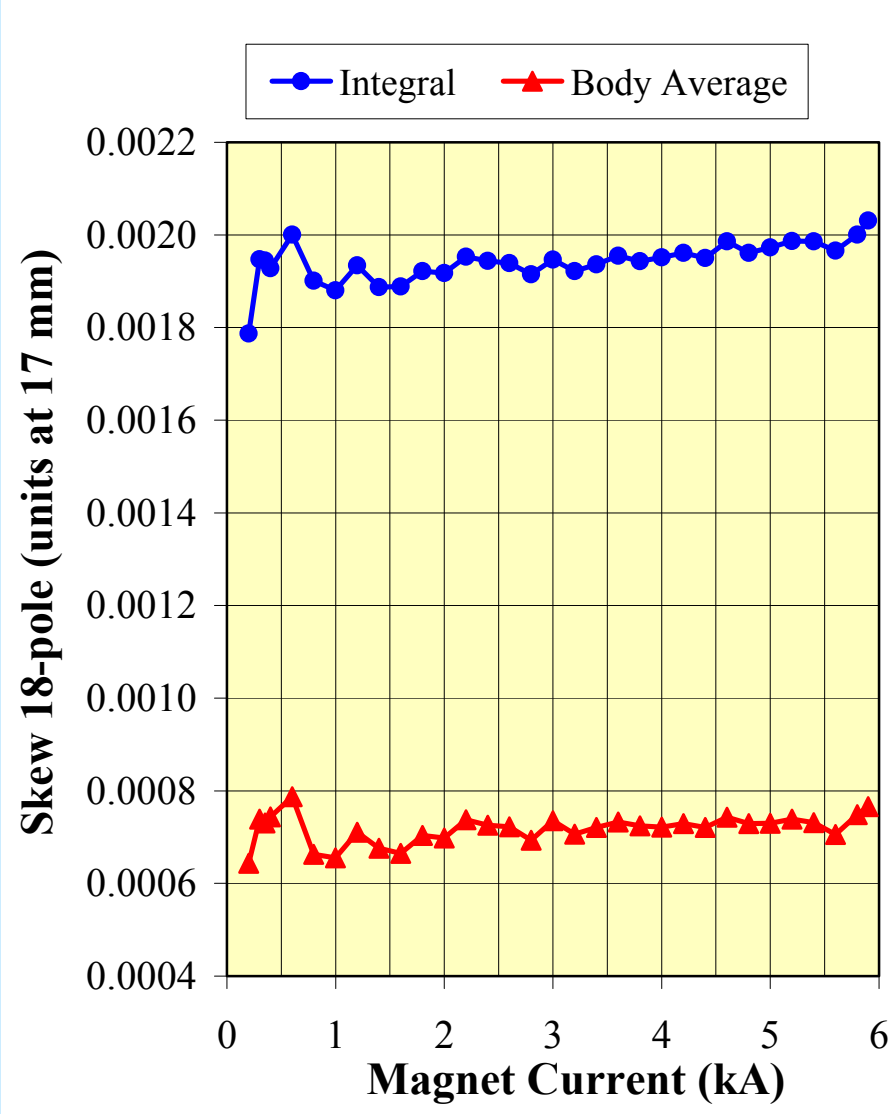
Integral and St. Section Field Quality in D1L103



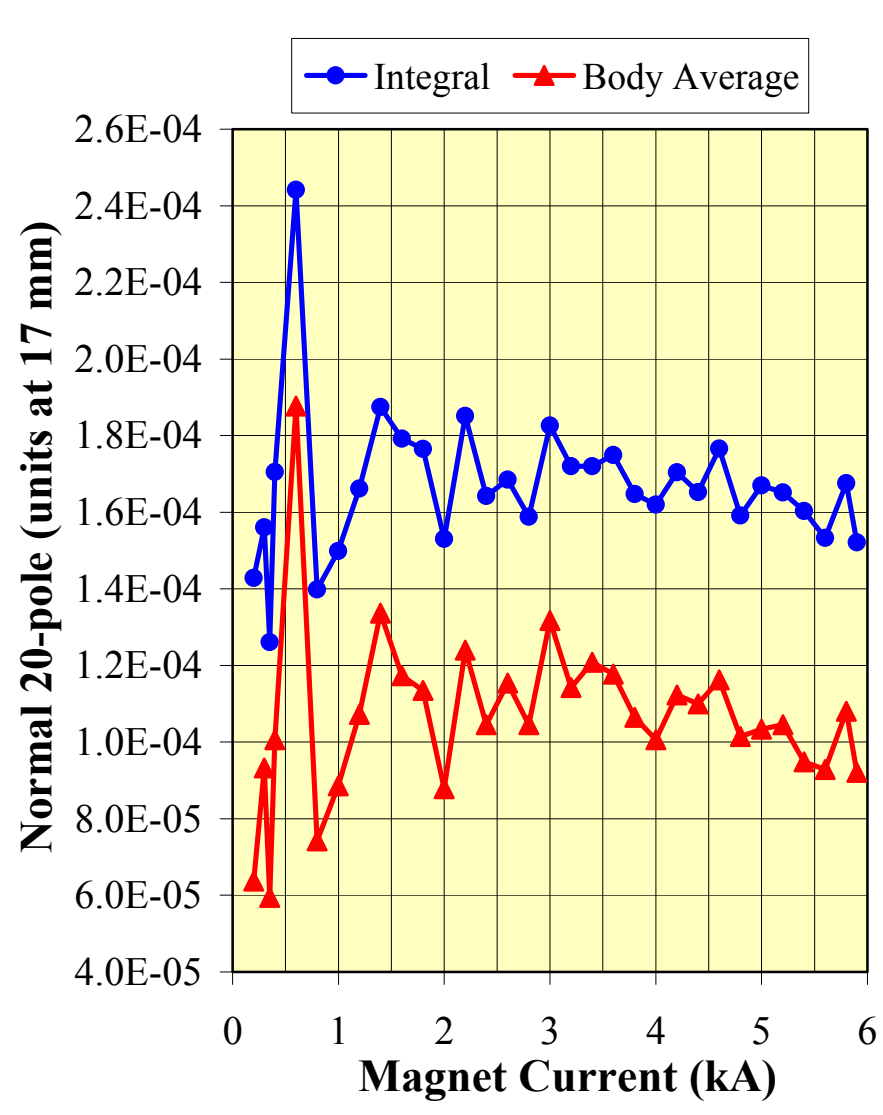


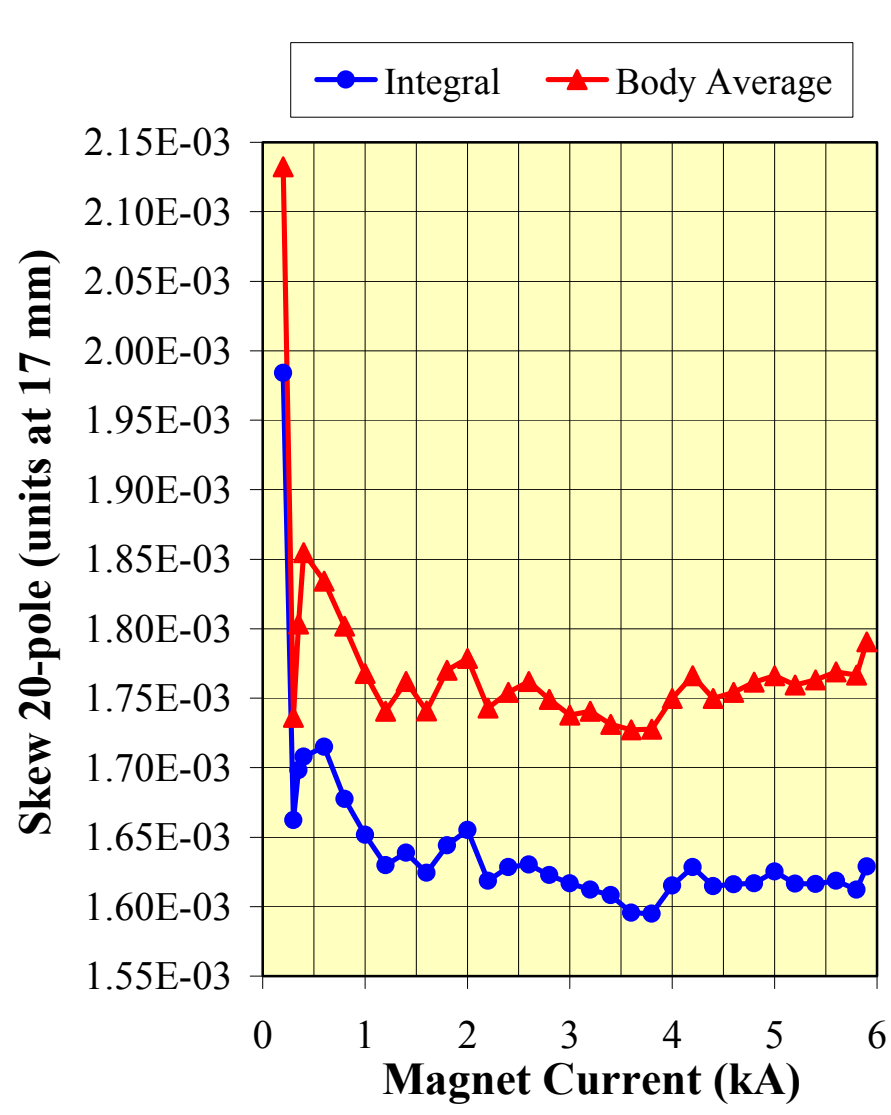
Integral and St. Section Field Quality in D1L103



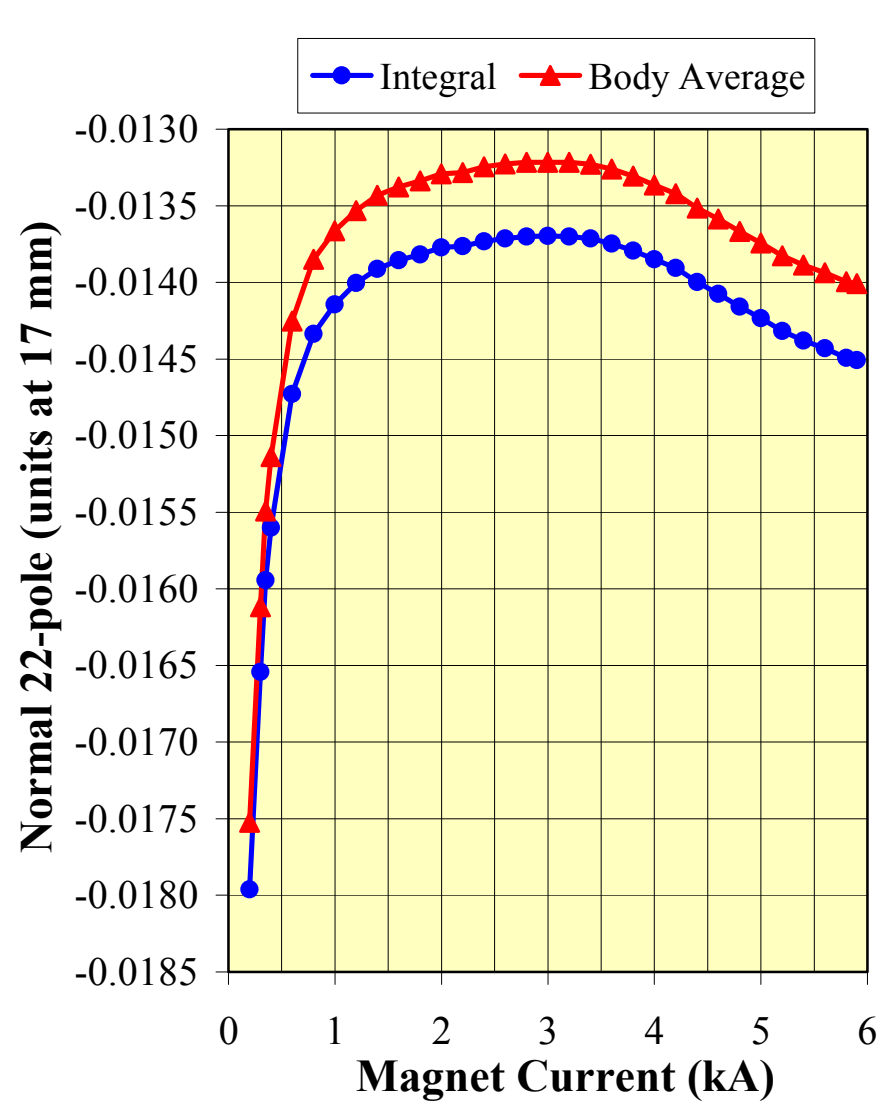


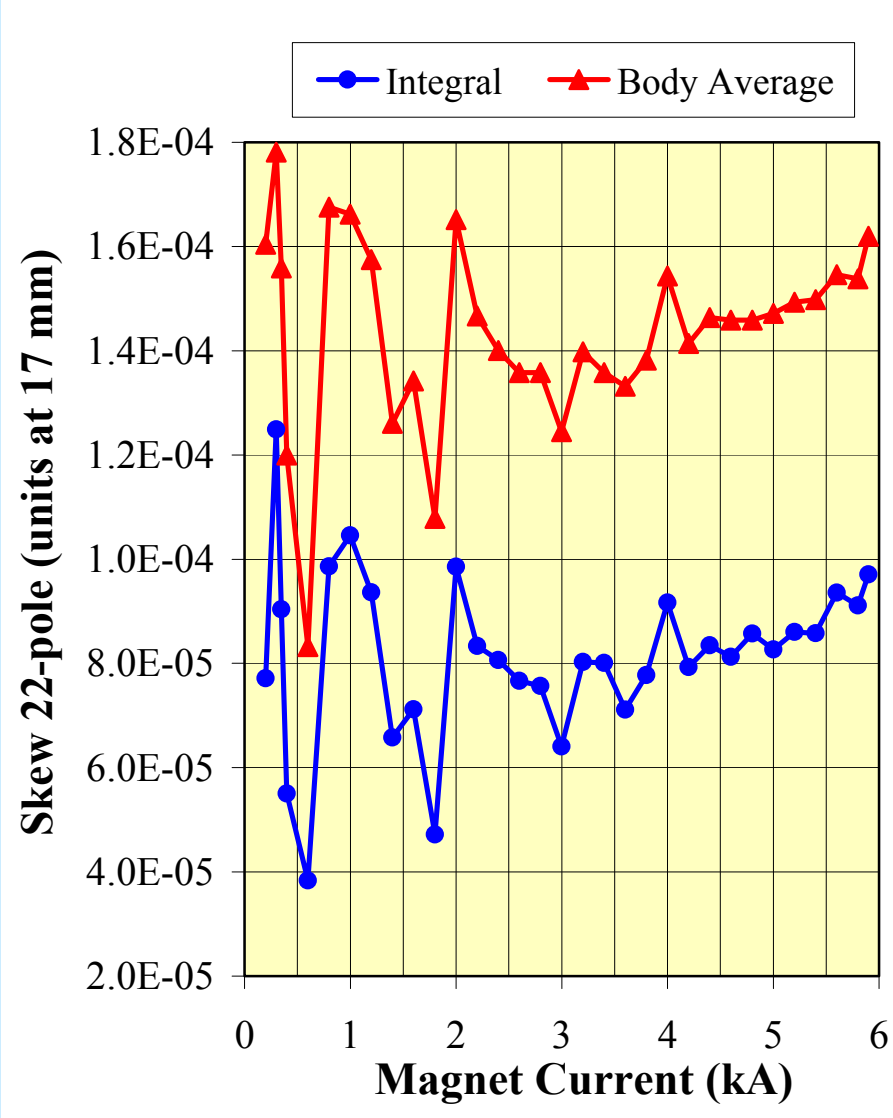
Integral and St. Section Field Quality in D1L103



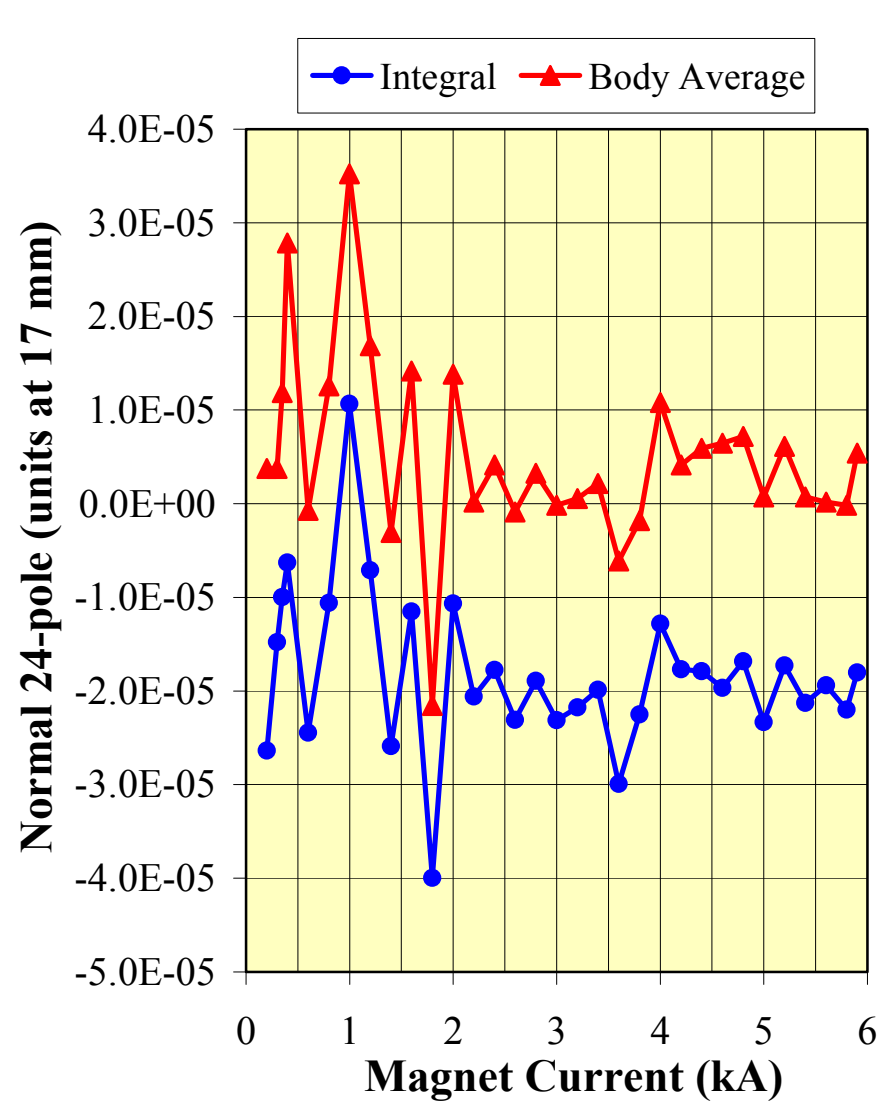


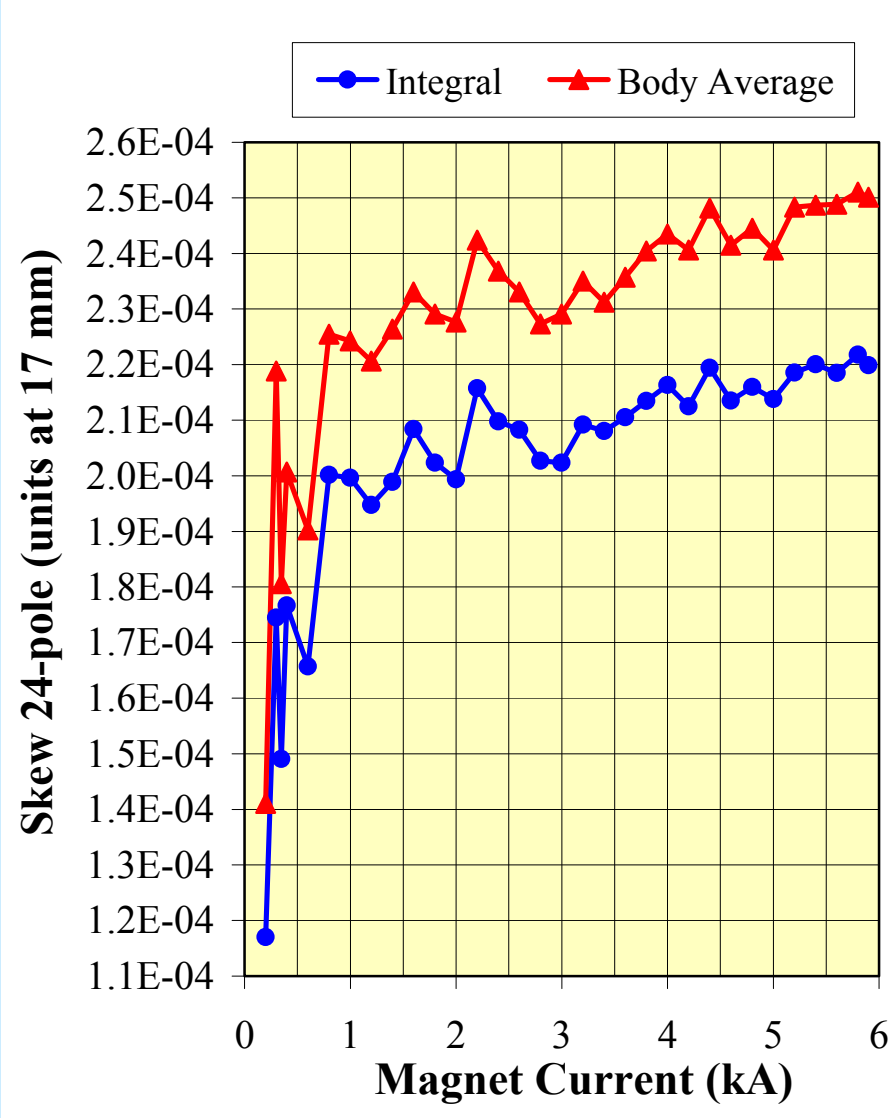
Integral and St. Section Field Quality in D1L103



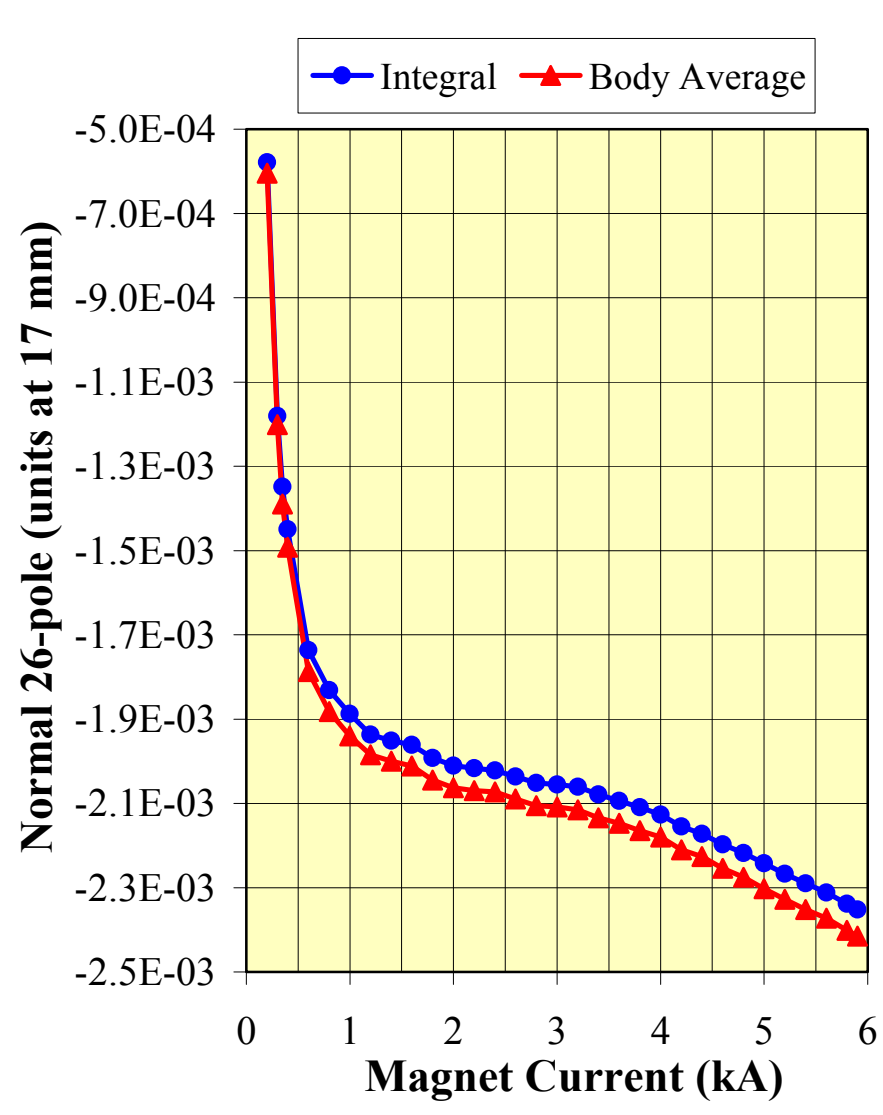


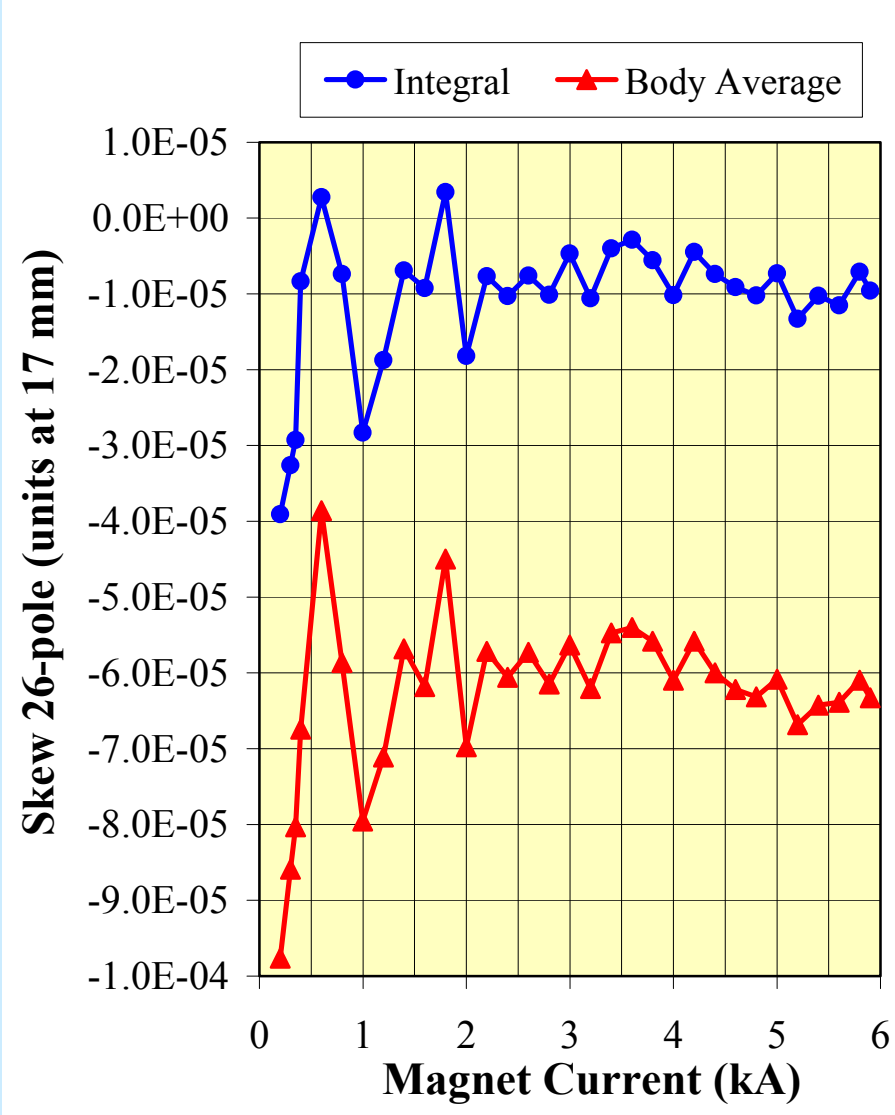
Integral and St. Section Field Quality in D1L103



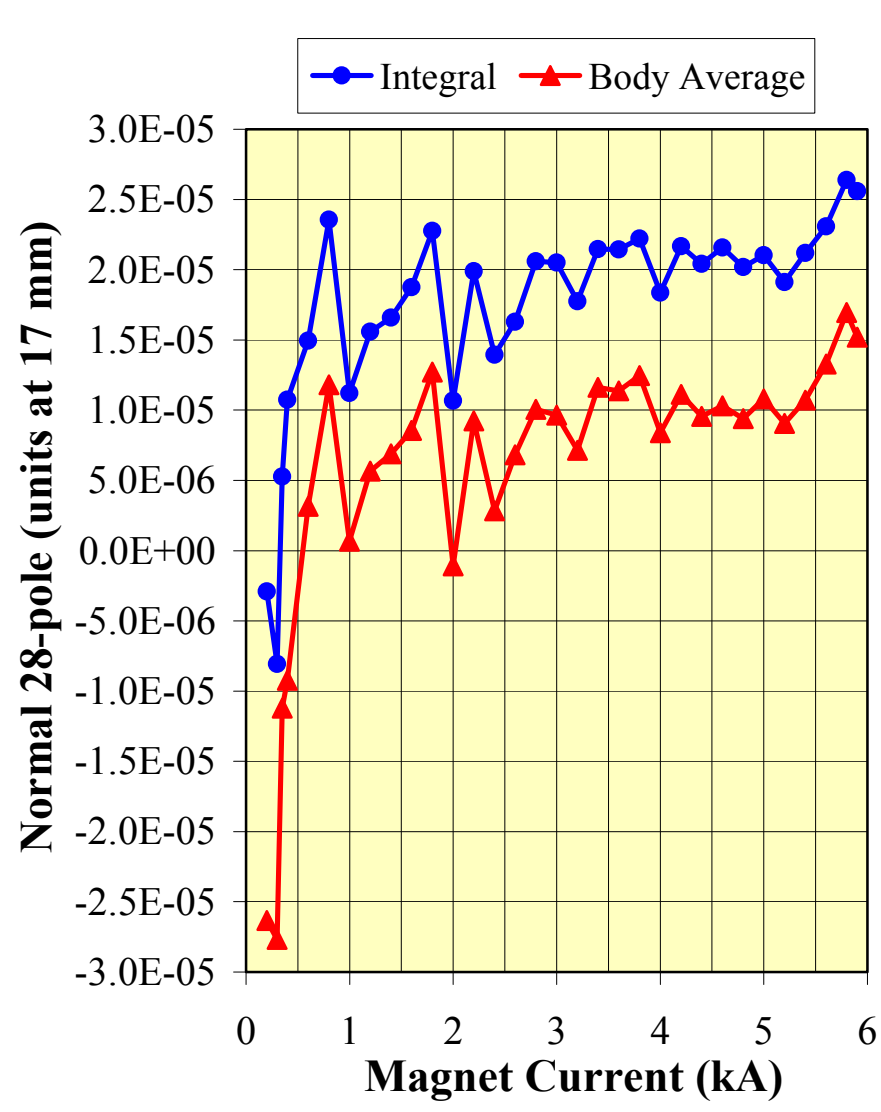


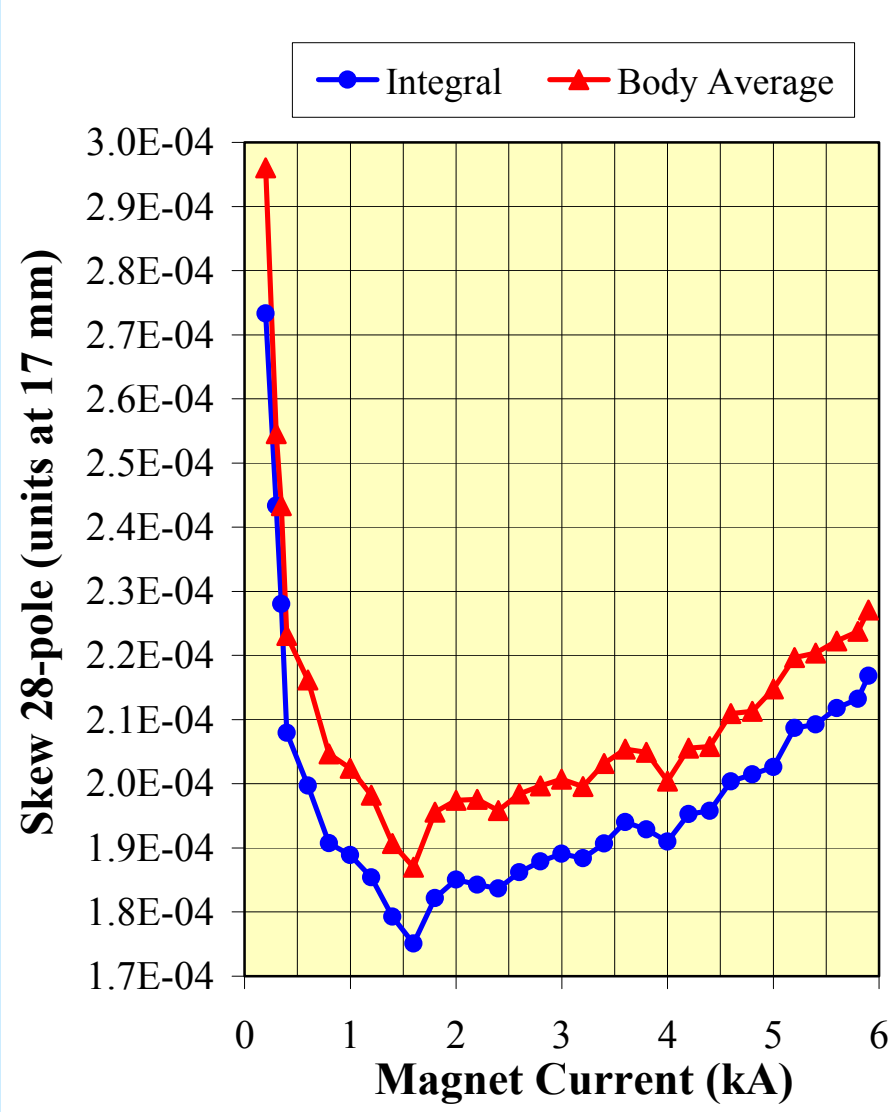
Integral and St. Section Field Quality in D1L103



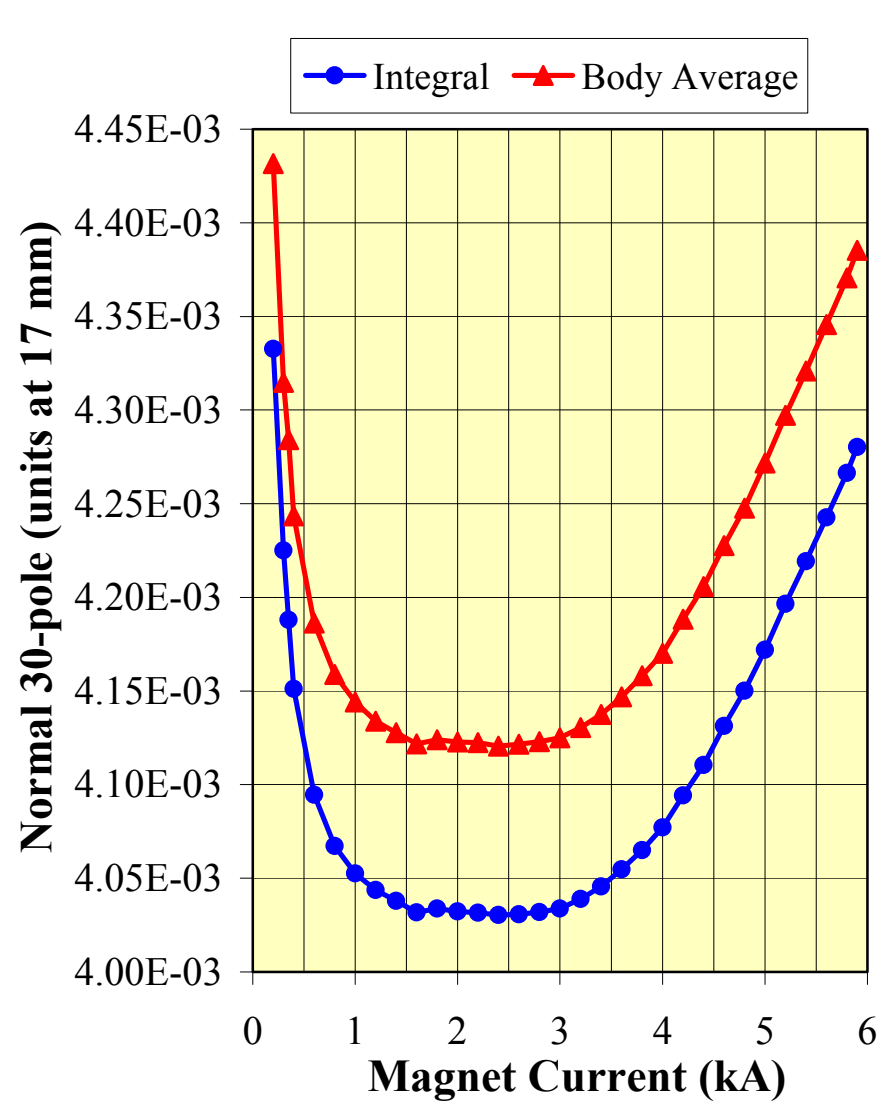


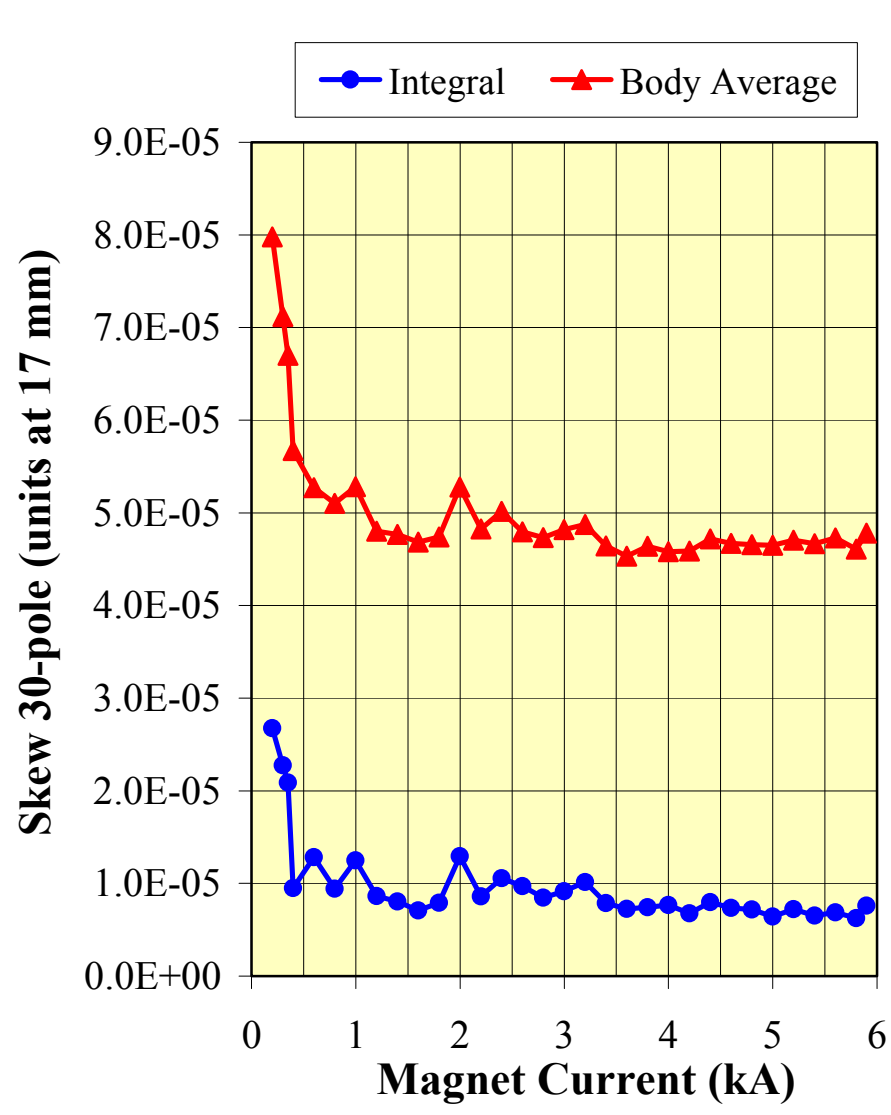
Integral and St. Section Field Quality in D1L103





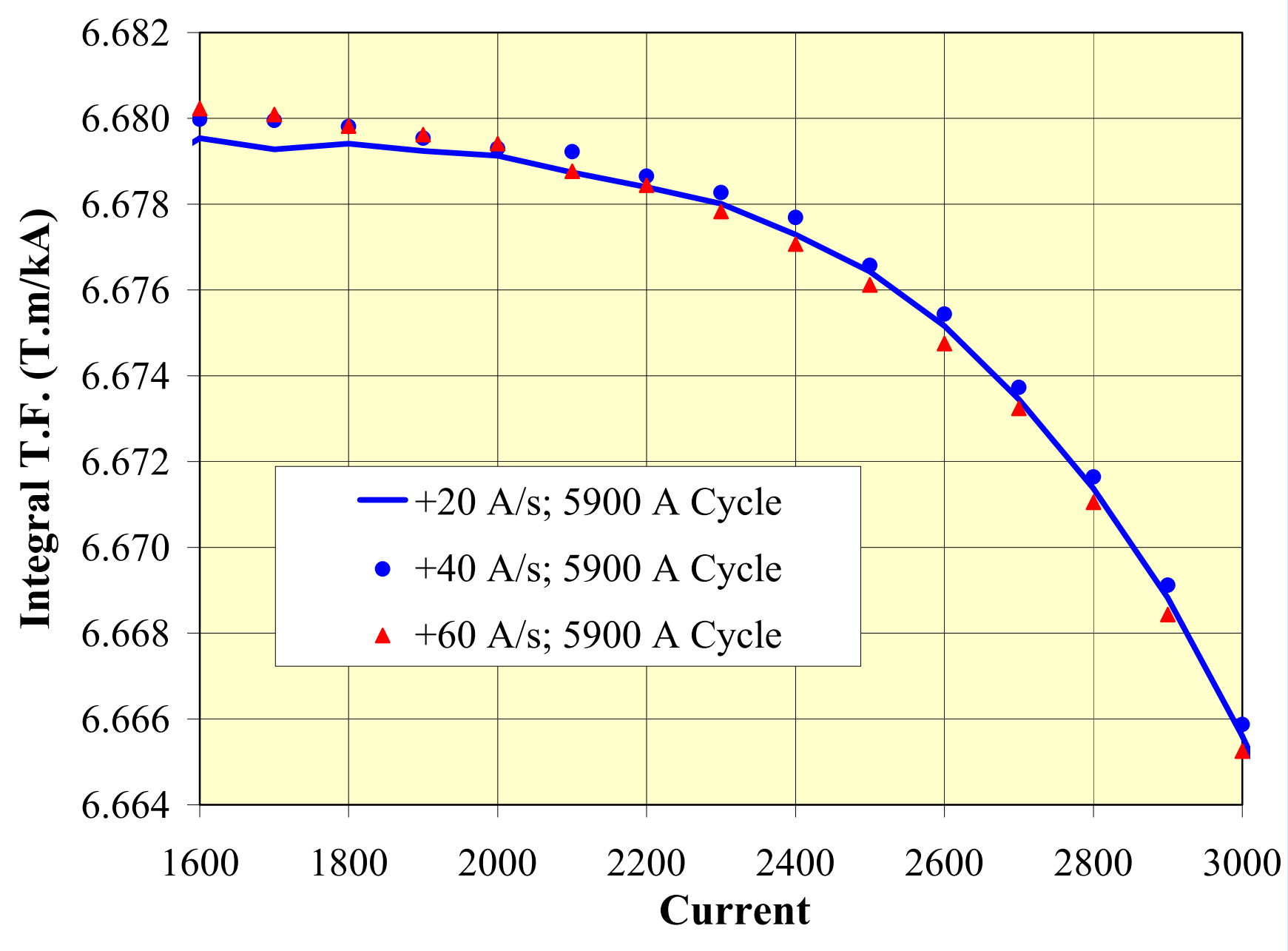
Integral and St. Section Field Quality in D1L103



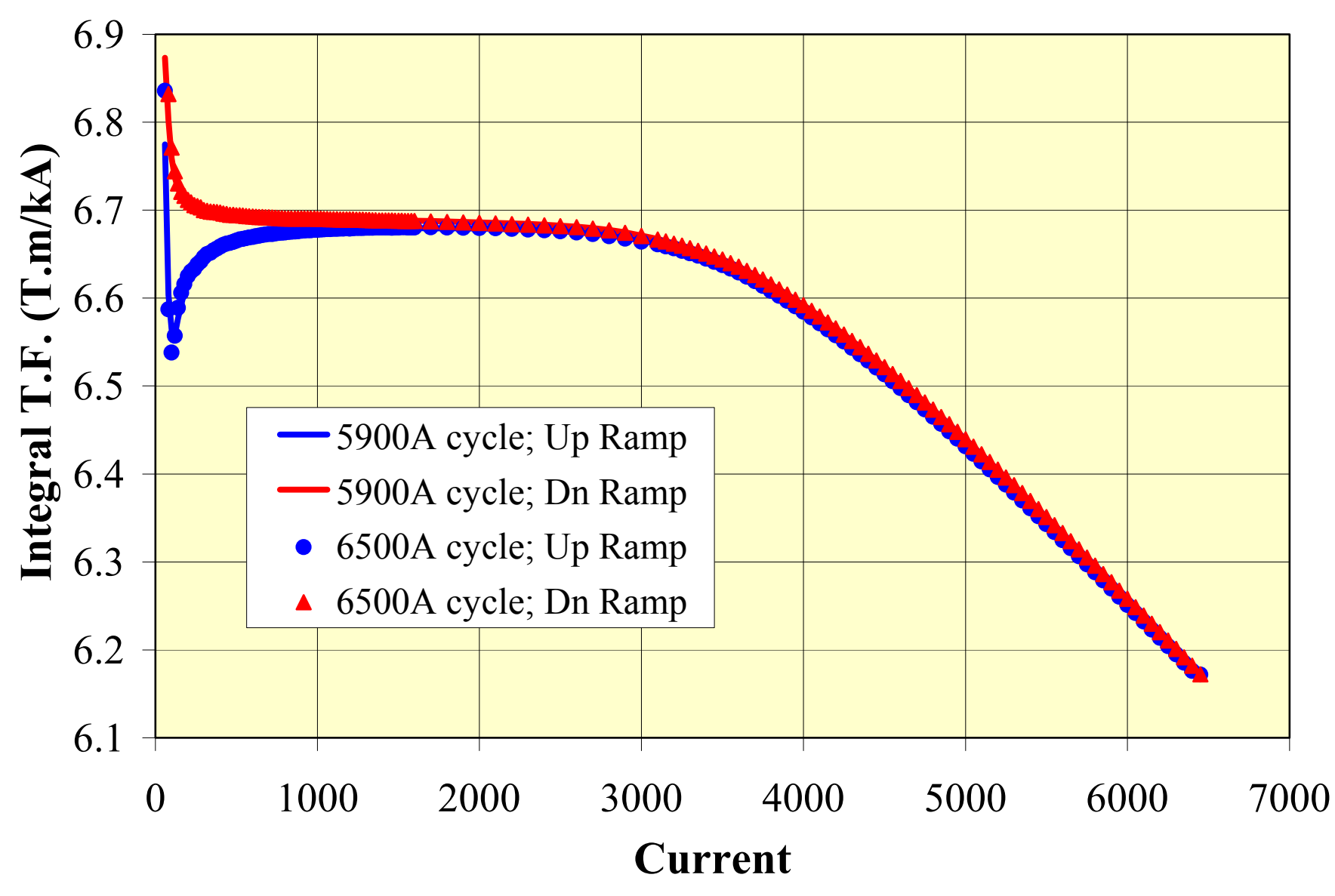


Integral Transfer Function Measured with a Non-rotating Integral Coil

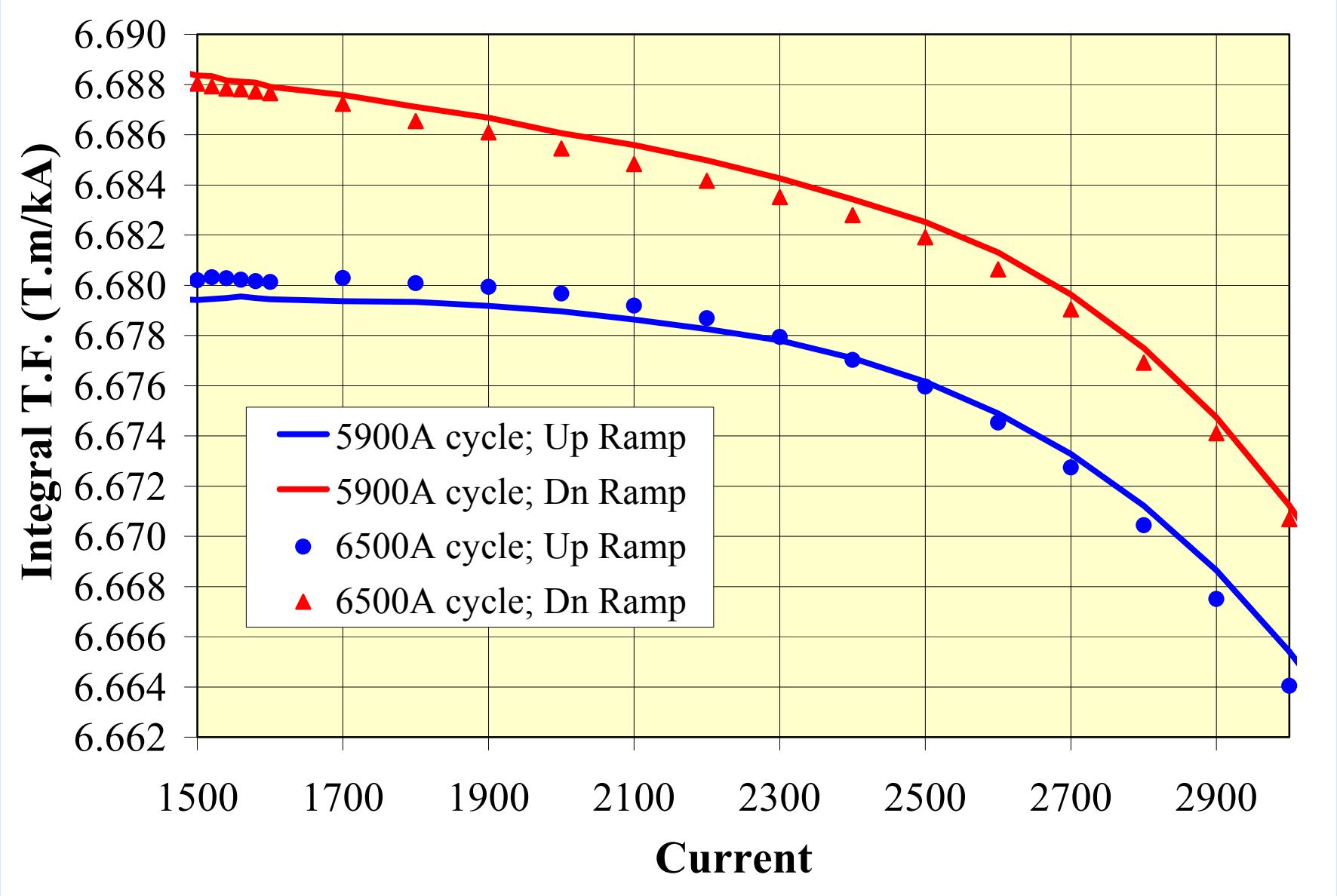
Integral Transfer Function in D1L103: Cold Integral Coil Data



Integral Transfer Function in D1L103: Cold Integral Coil Data



Integral Transfer Function in D1L103: Cold Integral Coil Data

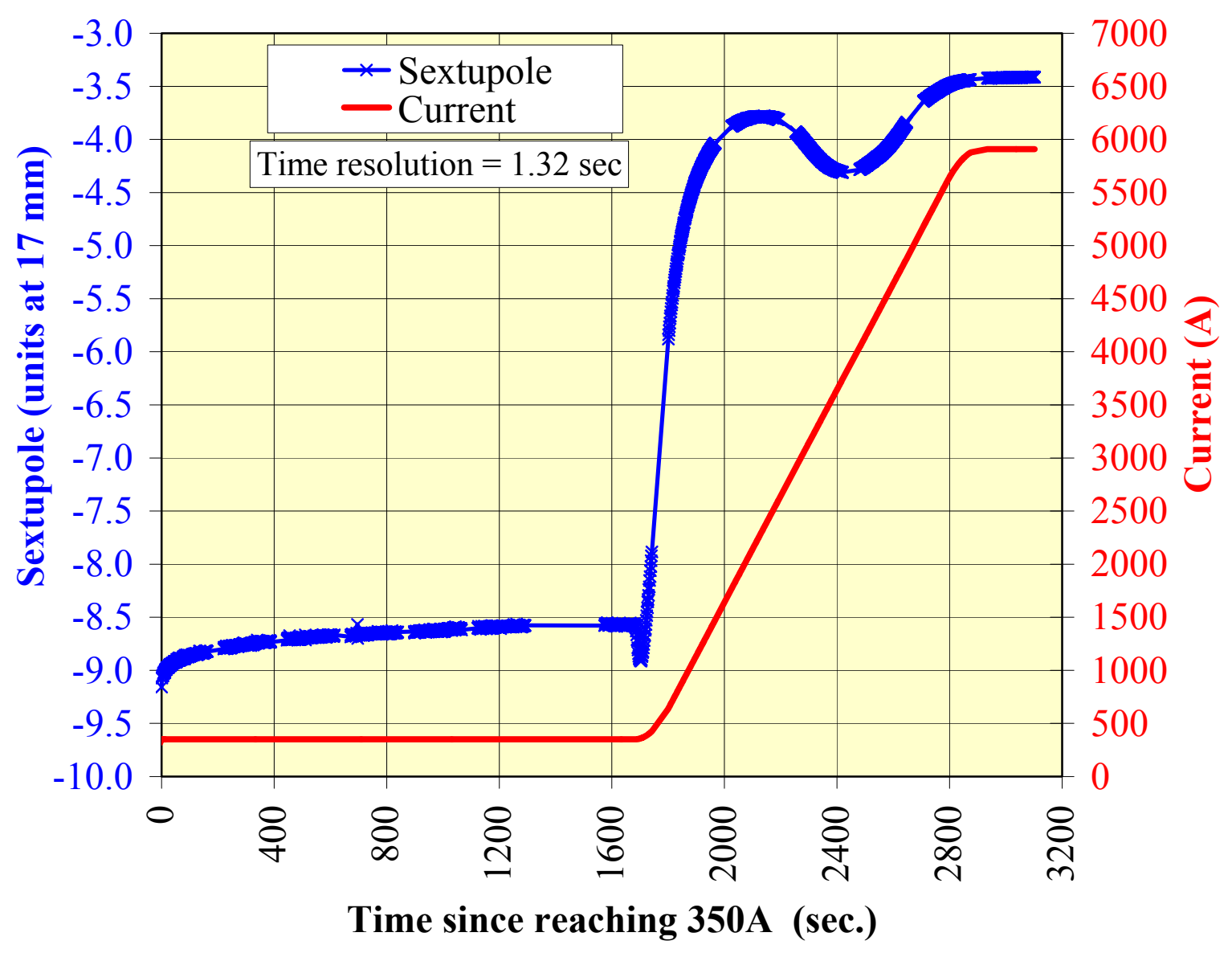


Dynamic Effects:

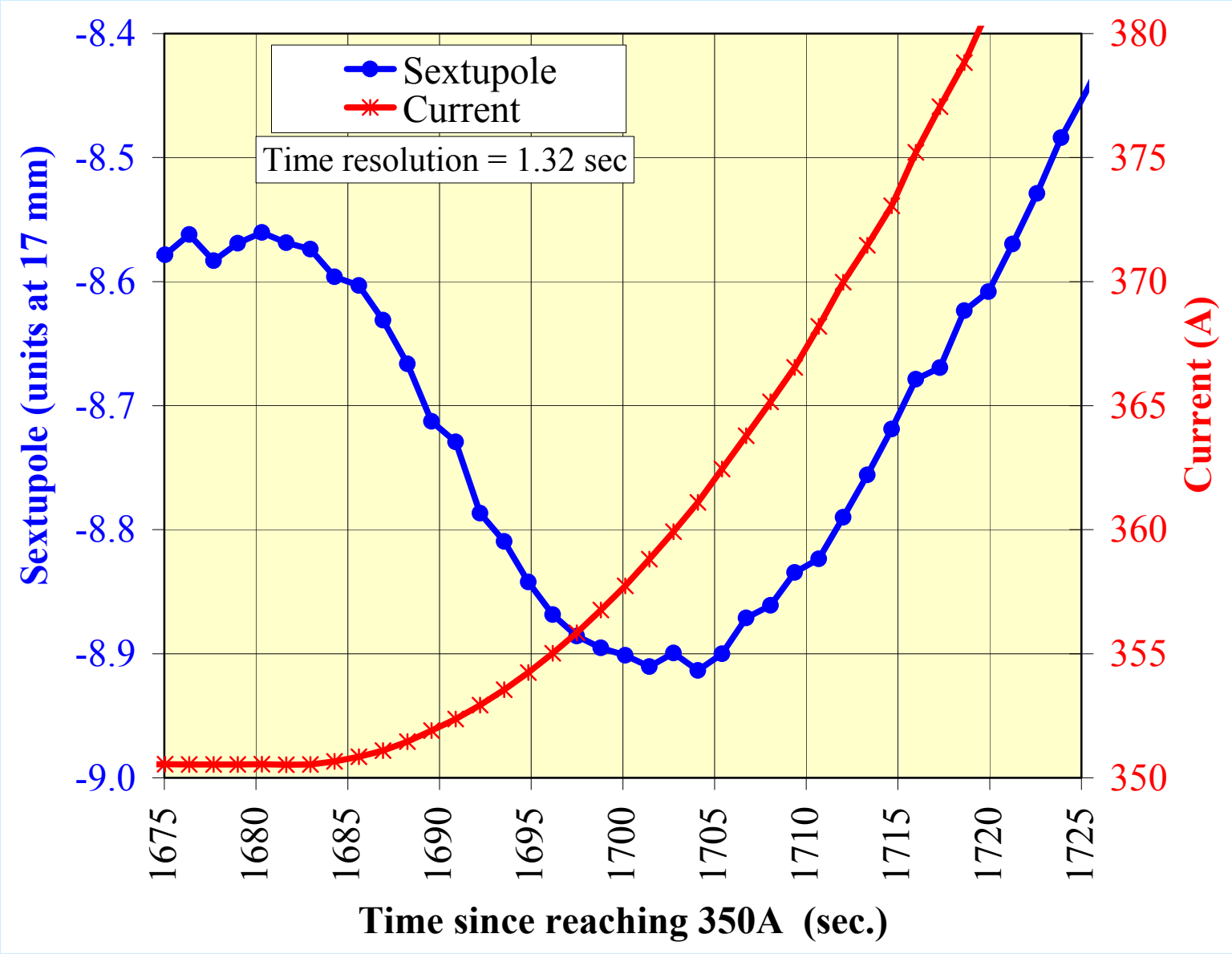
Sextupole Time Decay
Snapback
Ramp Rate Effects

(Data at 4.5 K)

Sextupole Time Decay & Snap-back in D1L103
(Quadratic Ramp; 350A to 5900A at 5A/s; Runs 59 and 60)

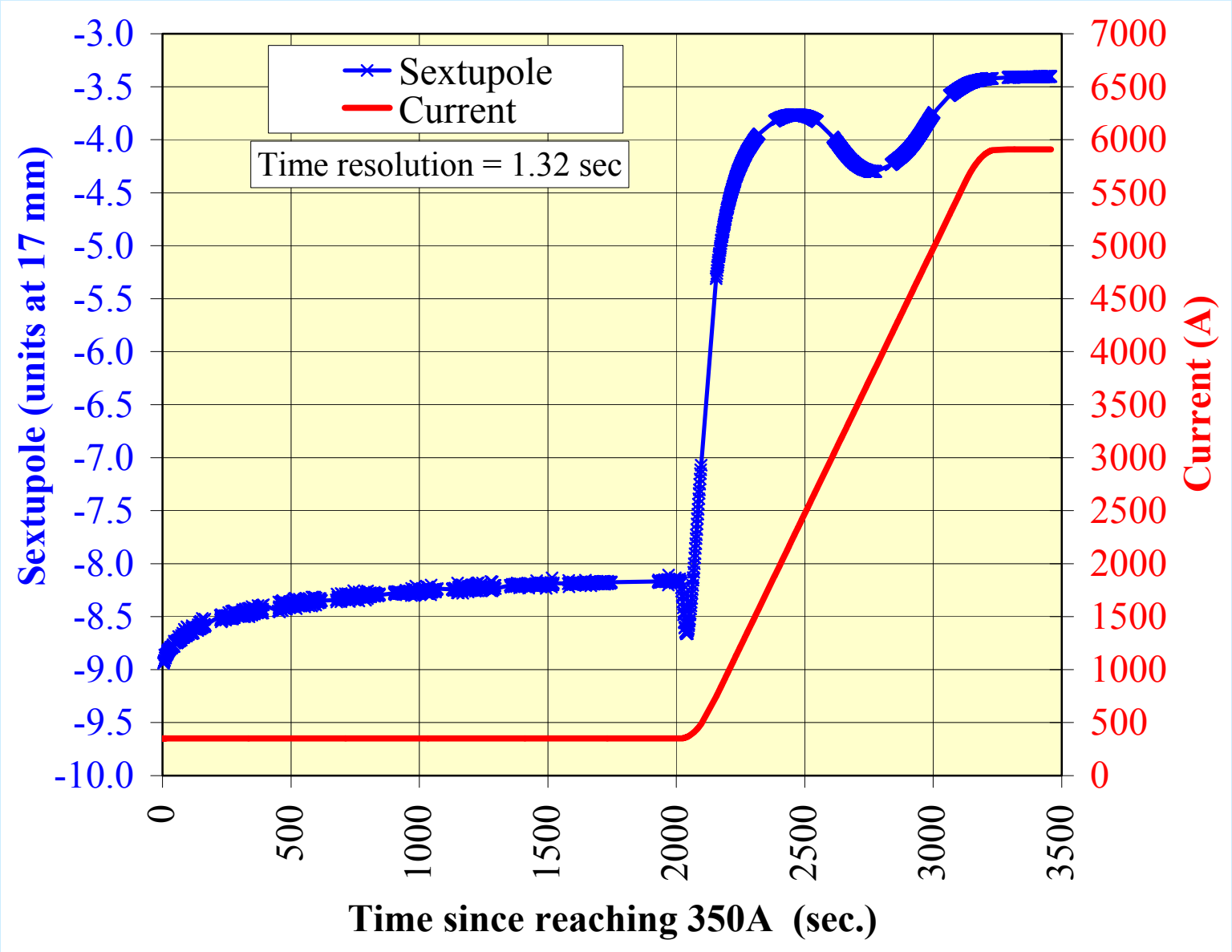


Sextupole Time Decay & Snap-back in D1L103
(Quadratic Ramp; 350A to 5900A at 5A/s; Runs 59 and 60)



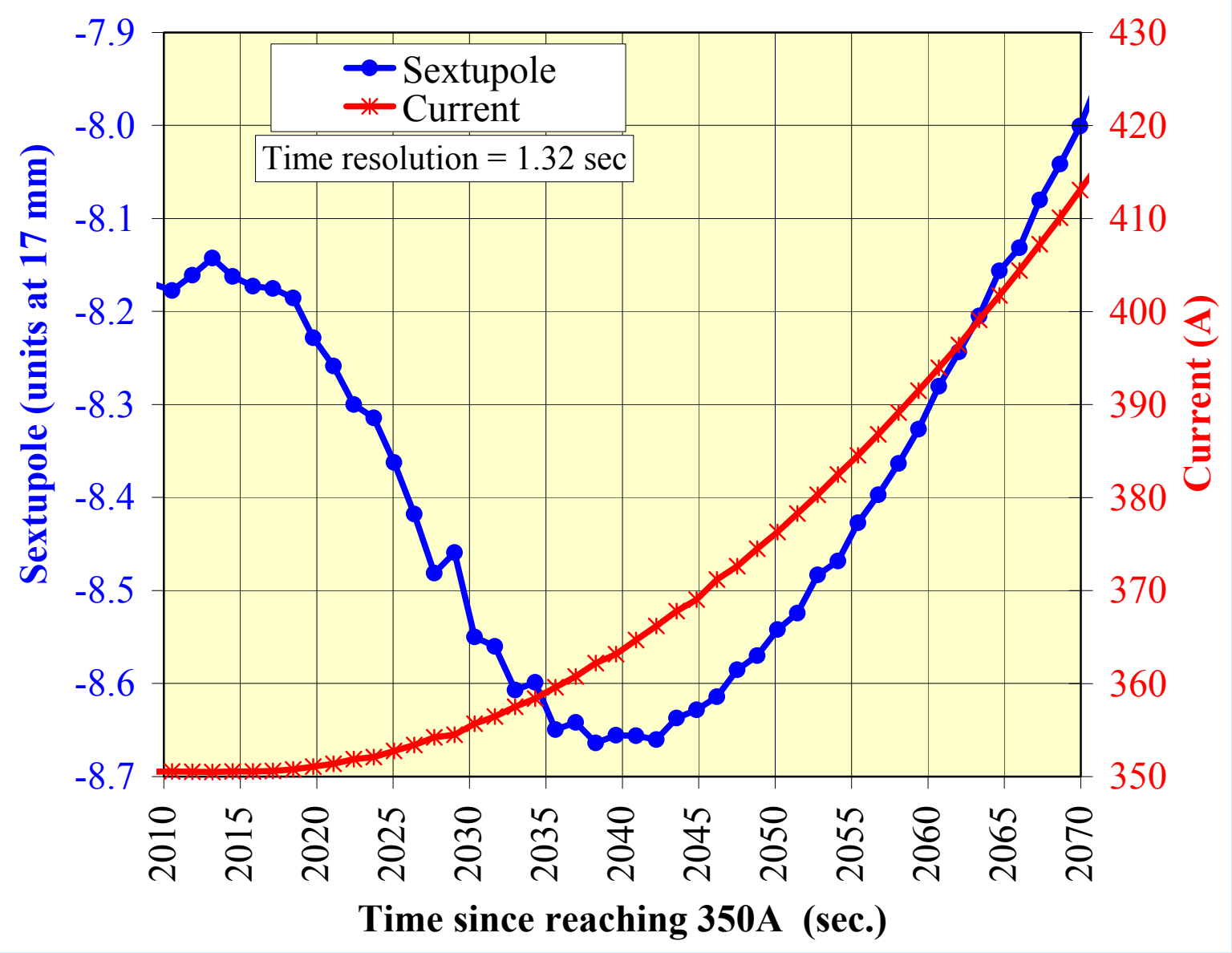
Sextupole Time Decay & Snap-back in D1L103

(Quadratic Ramp; 350A to 5900A at 5A/s; Runs 84 and 85)



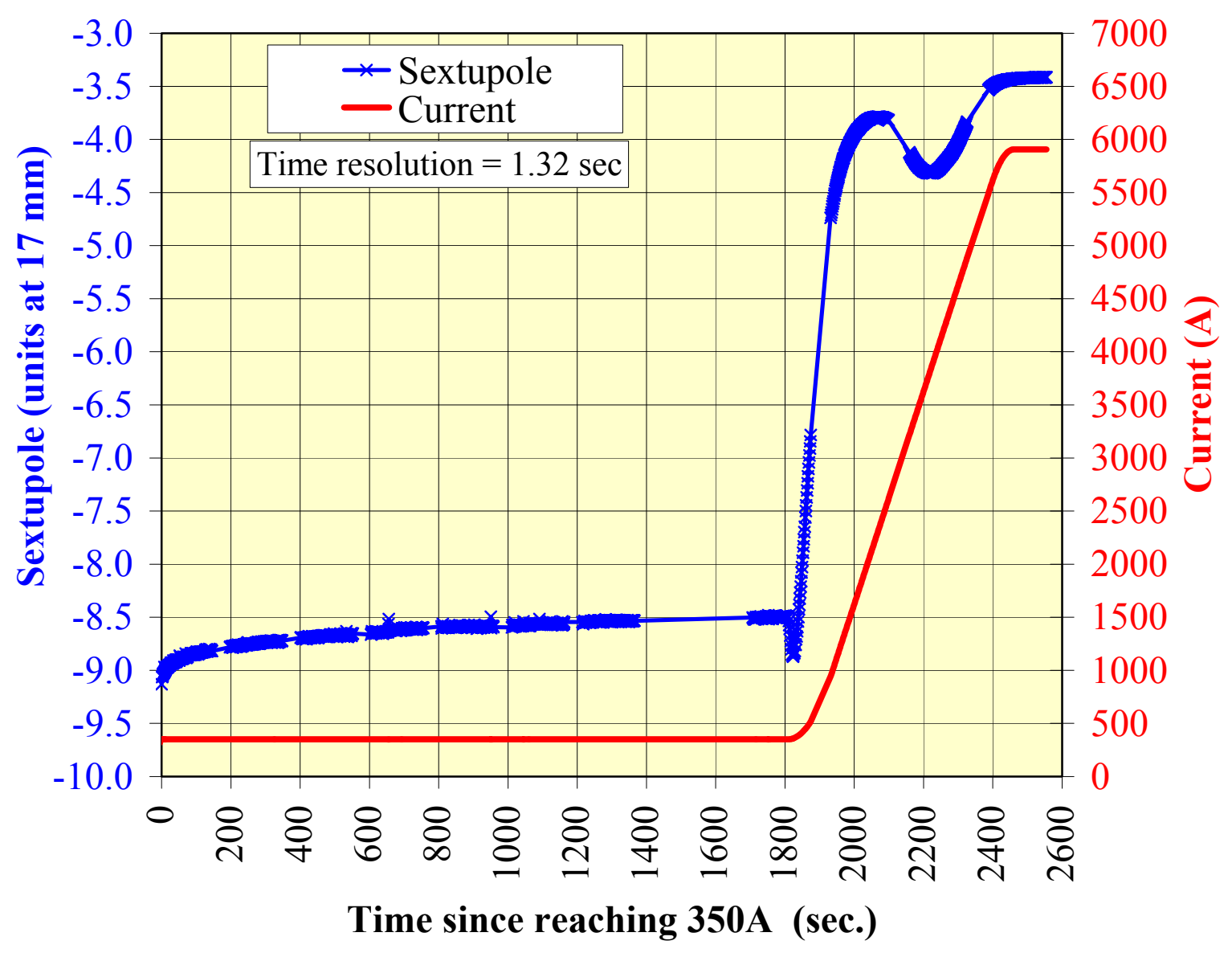
Sextupole Time Decay & Snap-back in D1L103

(Quadratic Ramp; 350A to 5900A at 5A/s; Runs 84 and 85)



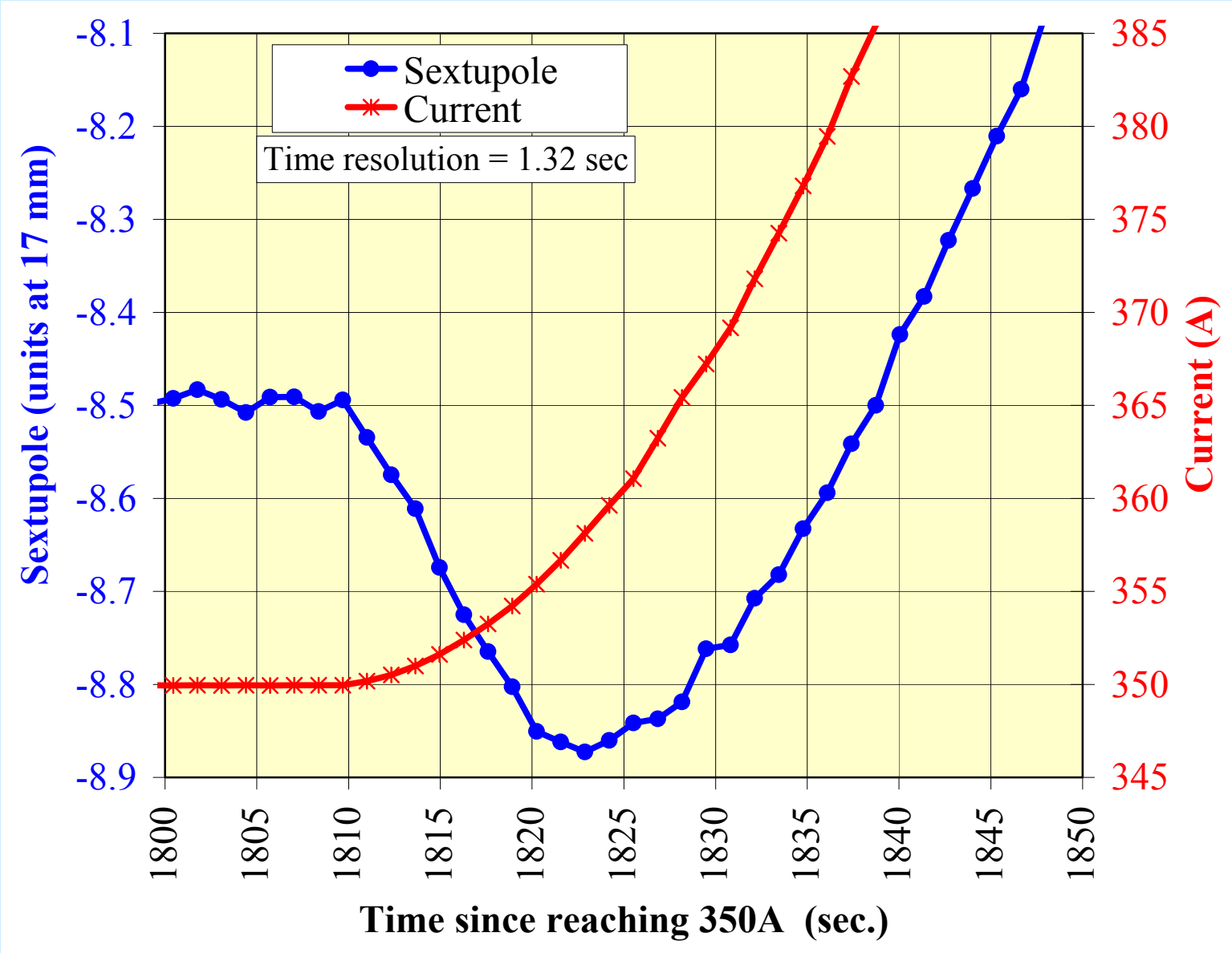
Sextupole Time Decay & Snap-back in D1L103

(Quadratic Ramp; 350A to 5900A at 10 A/s; Runs 62 and 63)



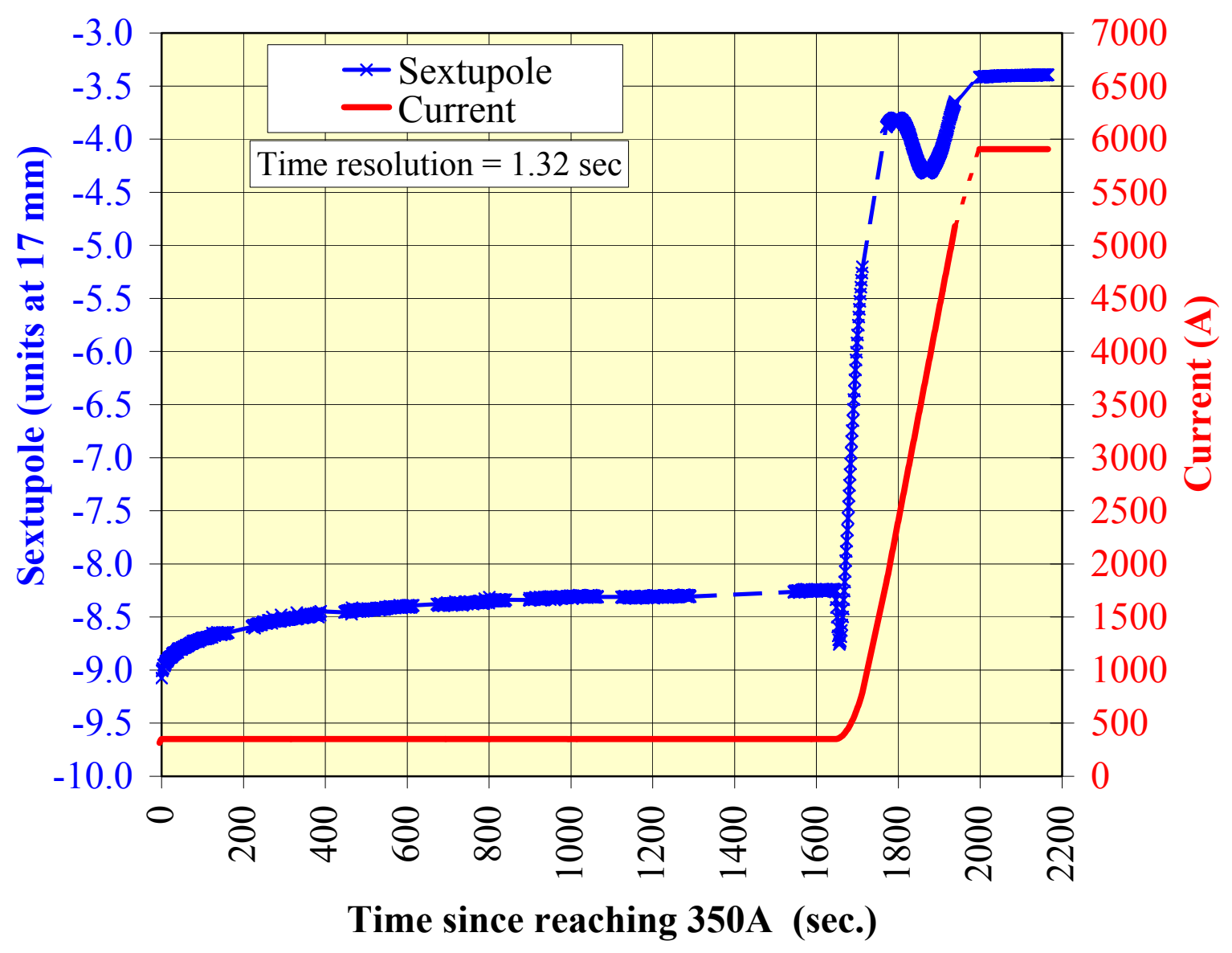
Sextupole Time Decay & Snap-back in D1L103

(Quadratic Ramp; 350A to 5900A at 10 A/s; Runs 62 and 63)

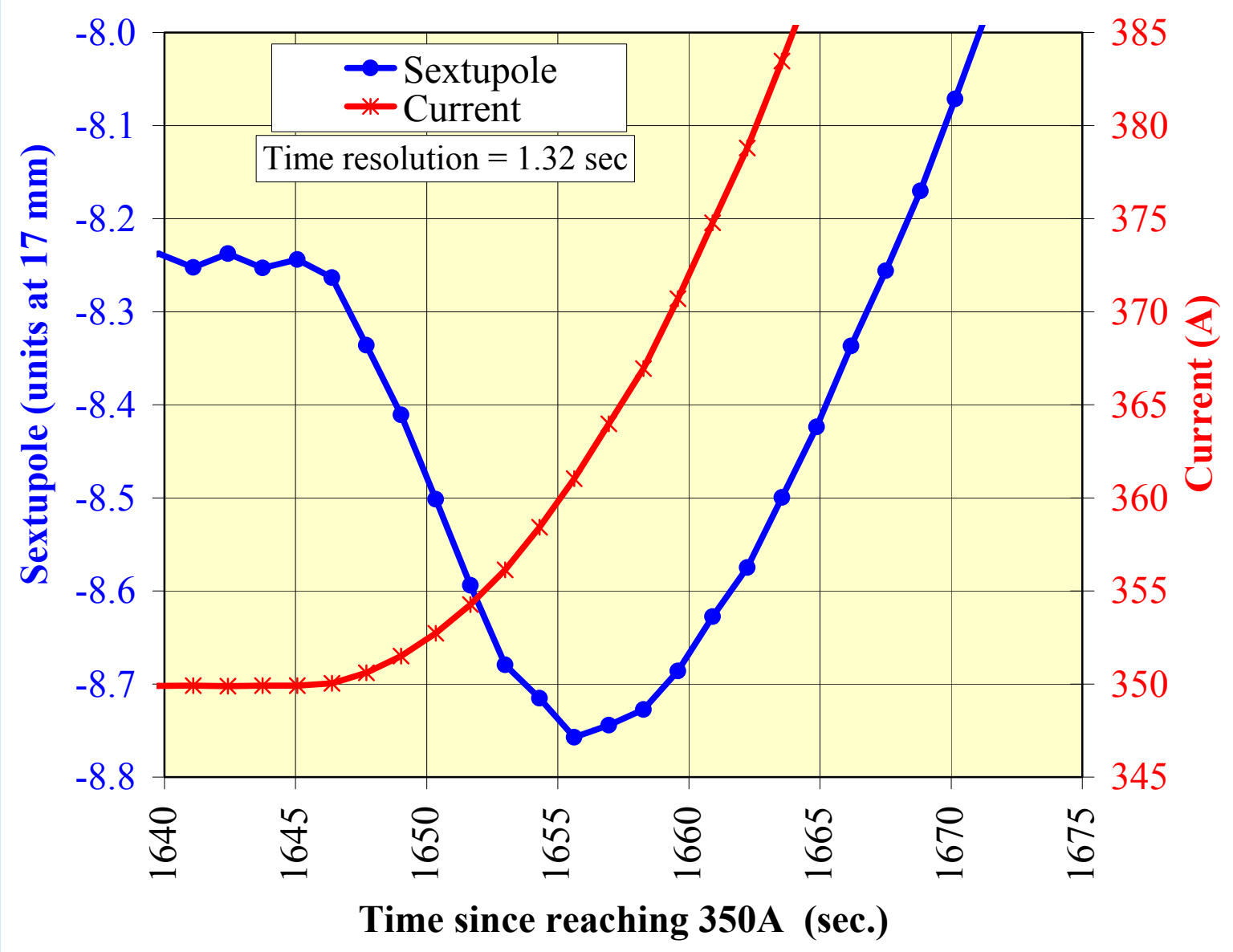


Sextupole Time Decay & Snap-back in D1L103

(Quadratic Ramp; 350A to 5900A at 20A/s; Runs 65 and 66)

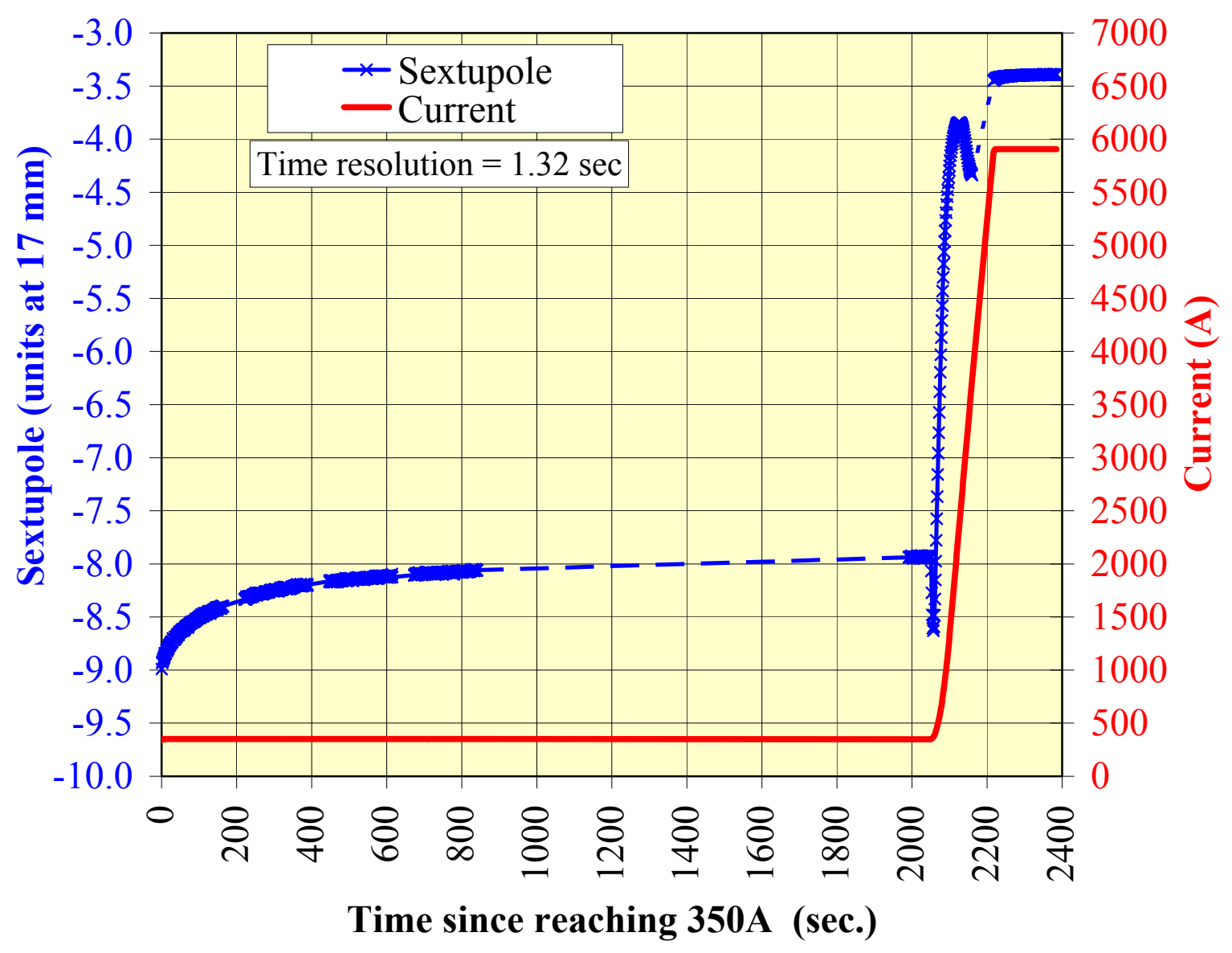


Sextupole Time Decay & Snap-back in D1L103
(Quadratic Ramp; 350A to 5900A at 20A/s; Runs 65 and 66)



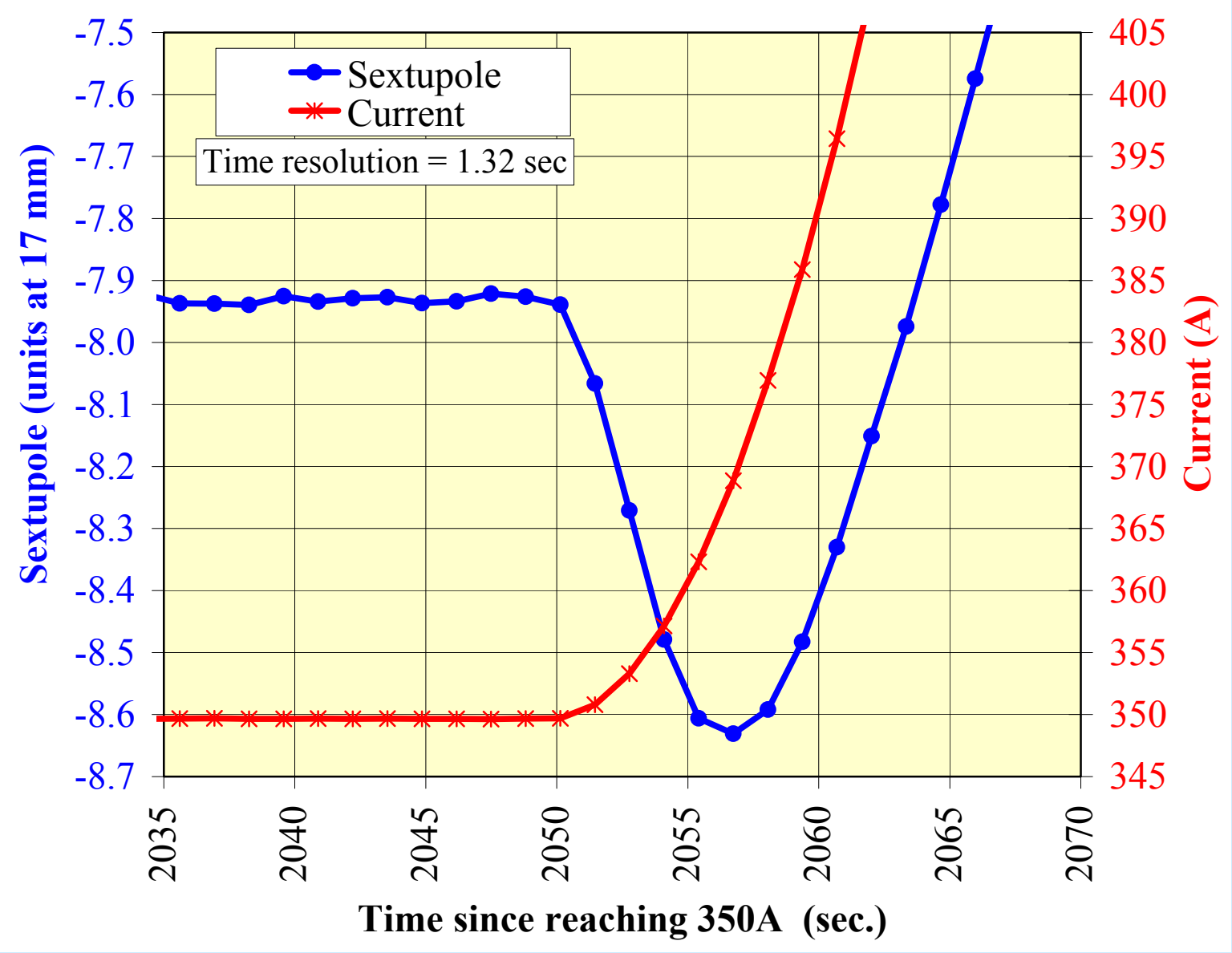
Sextupole Time Decay & Snap-back in D1L103

(Quadratic Ramp; 350A to 5900A at 40A/s; Runs 68 and 69)

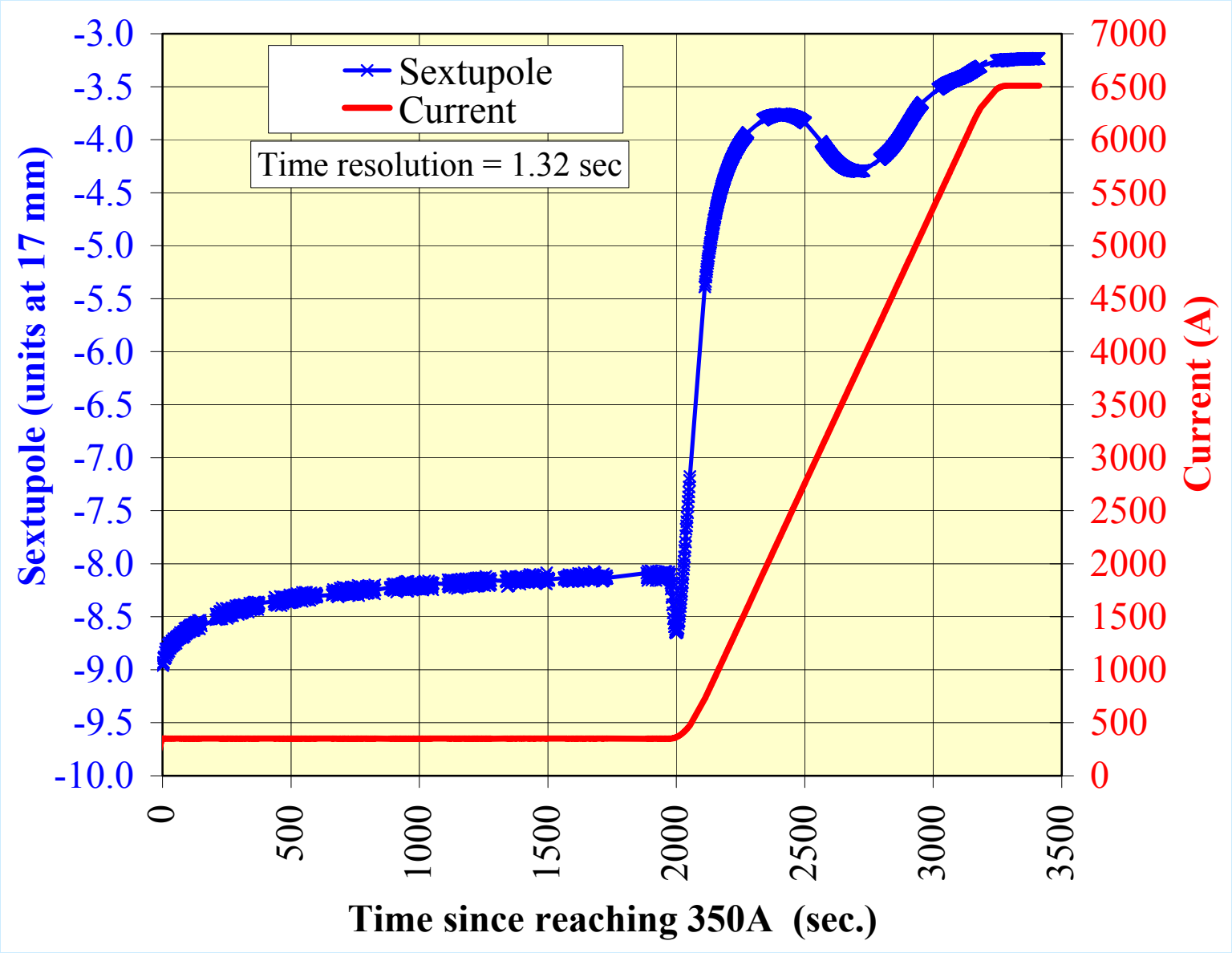


Sextupole Time Decay & Snap-back in D1L103

(Quadratic Ramp; 350A to 5900A at 40A/s; Runs 68 and 69)

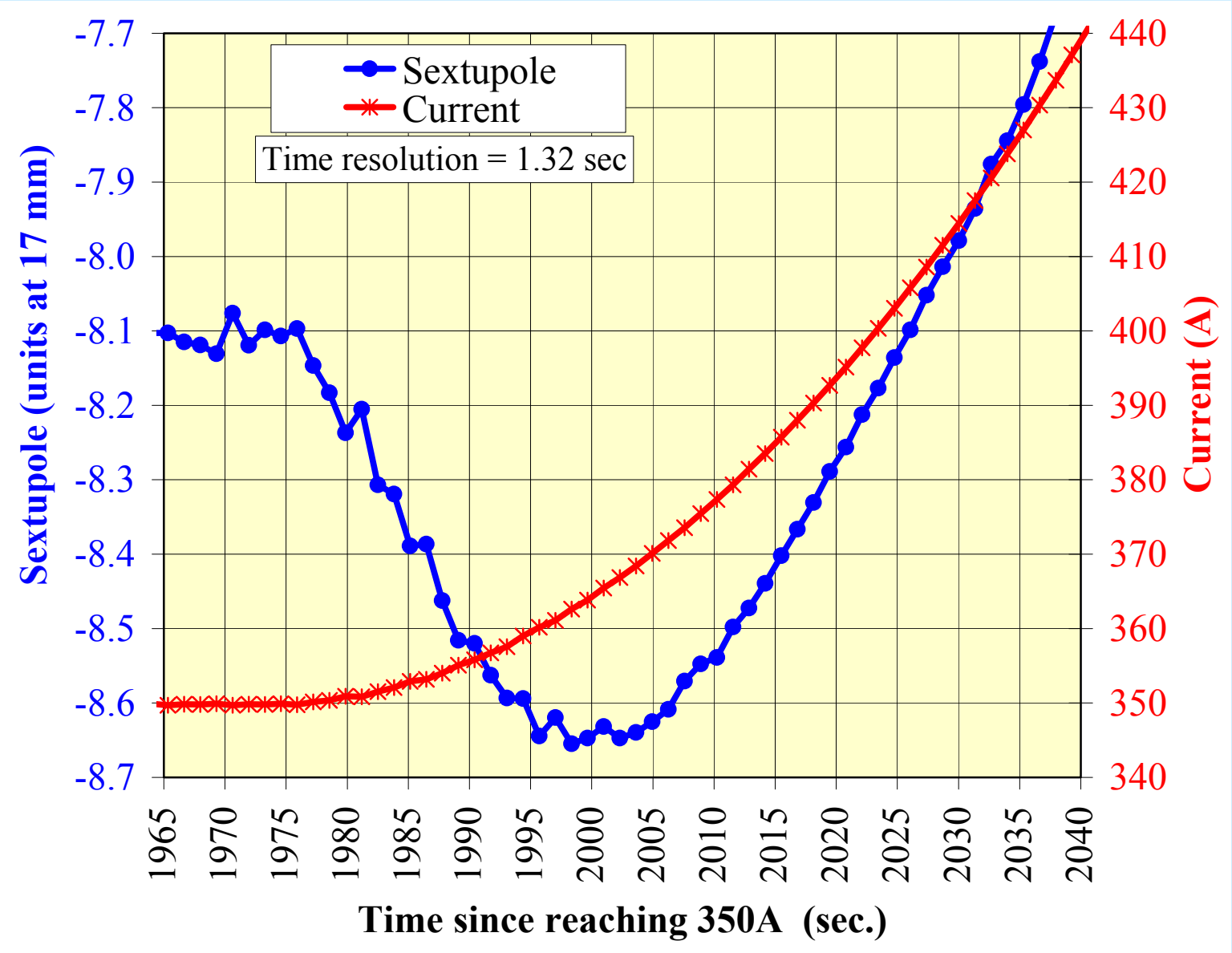


Sextupole Time Decay & Snap-back in D1L103
(Quadratic Ramp; 350A to 6500A at 5A/s; Runs 95 and 96)

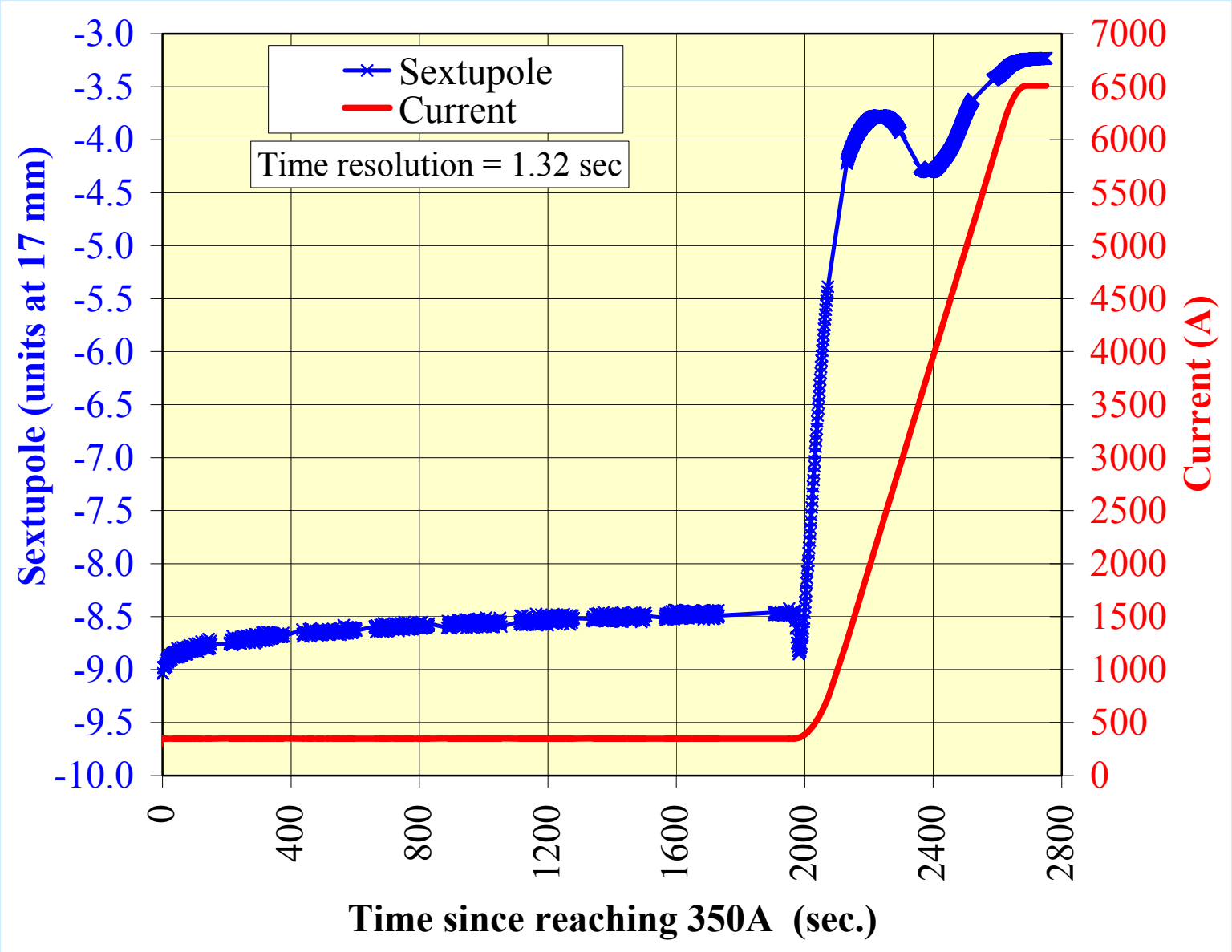


Sextupole Time Decay & Snap-back in D1L103

(Quadratic Ramp; 350A to 6500A at 5A/s; Runs 95 and 96)

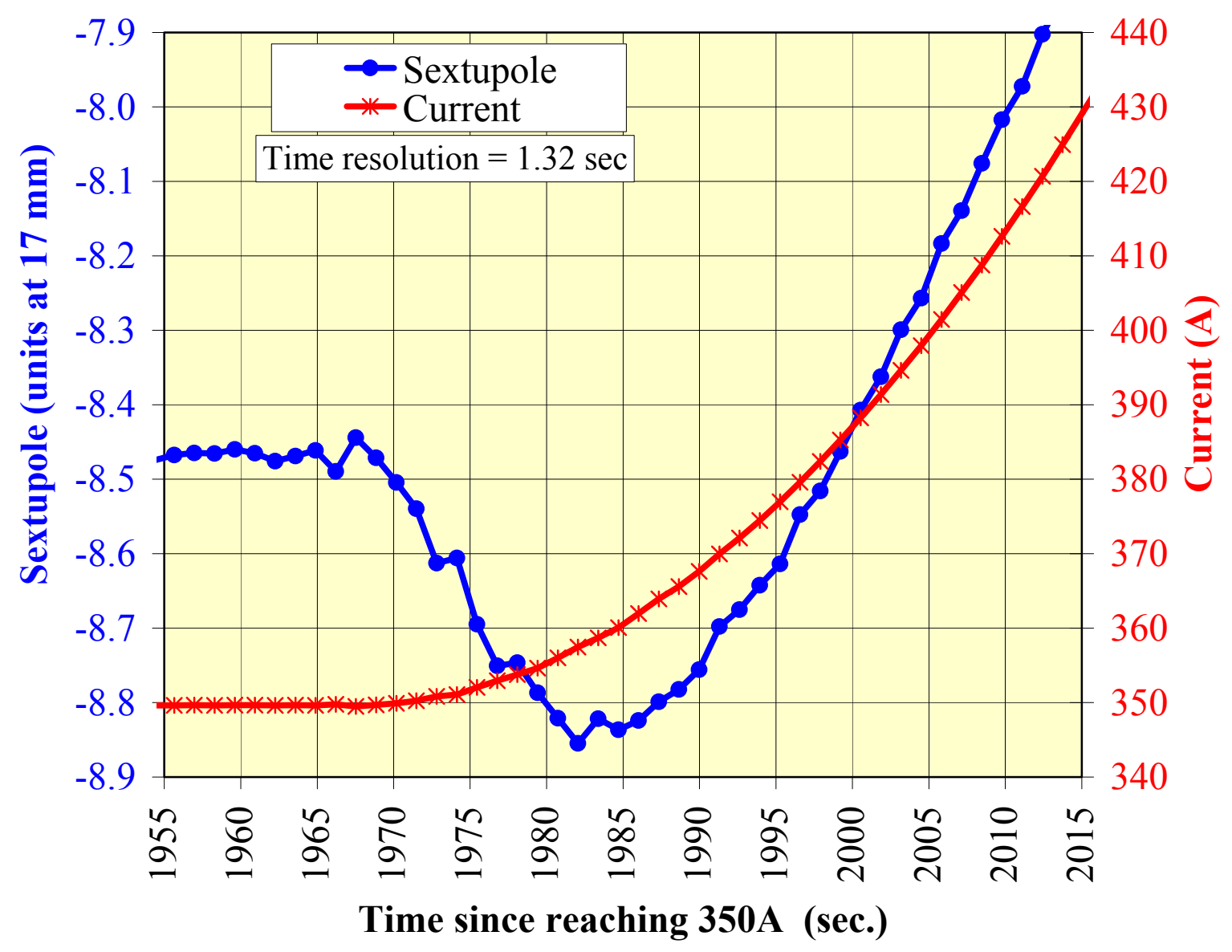


Sextupole Time Decay & Snap-back in D1L103
(Quadratic Ramp; 350A to 6500A at 10 A/s; Runs 98 and 99)



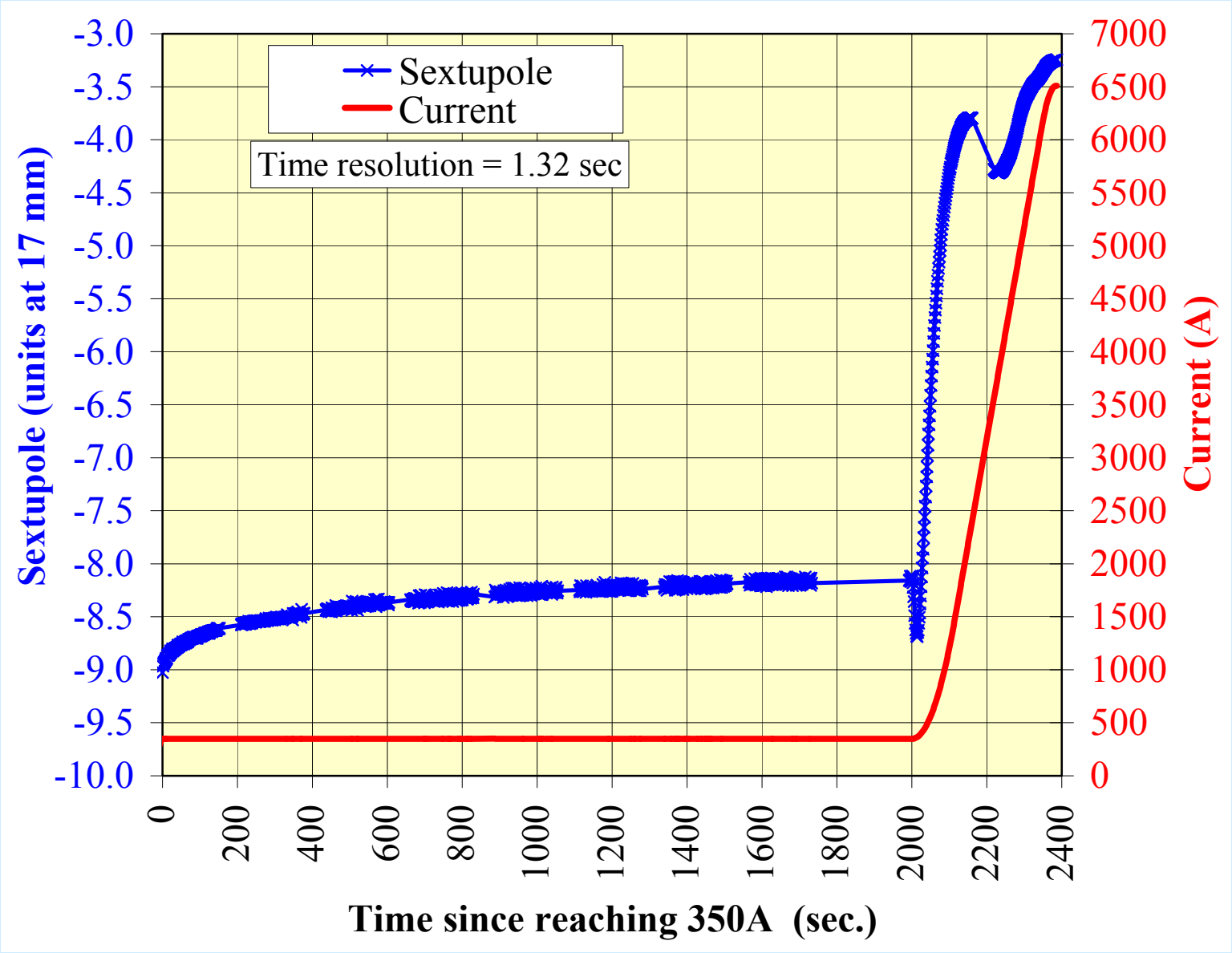
Sextupole Time Decay & Snap-back in D1L103

(Quadratic Ramp; 350A to 6500A at 10 A/s; Runs 98 and 99)



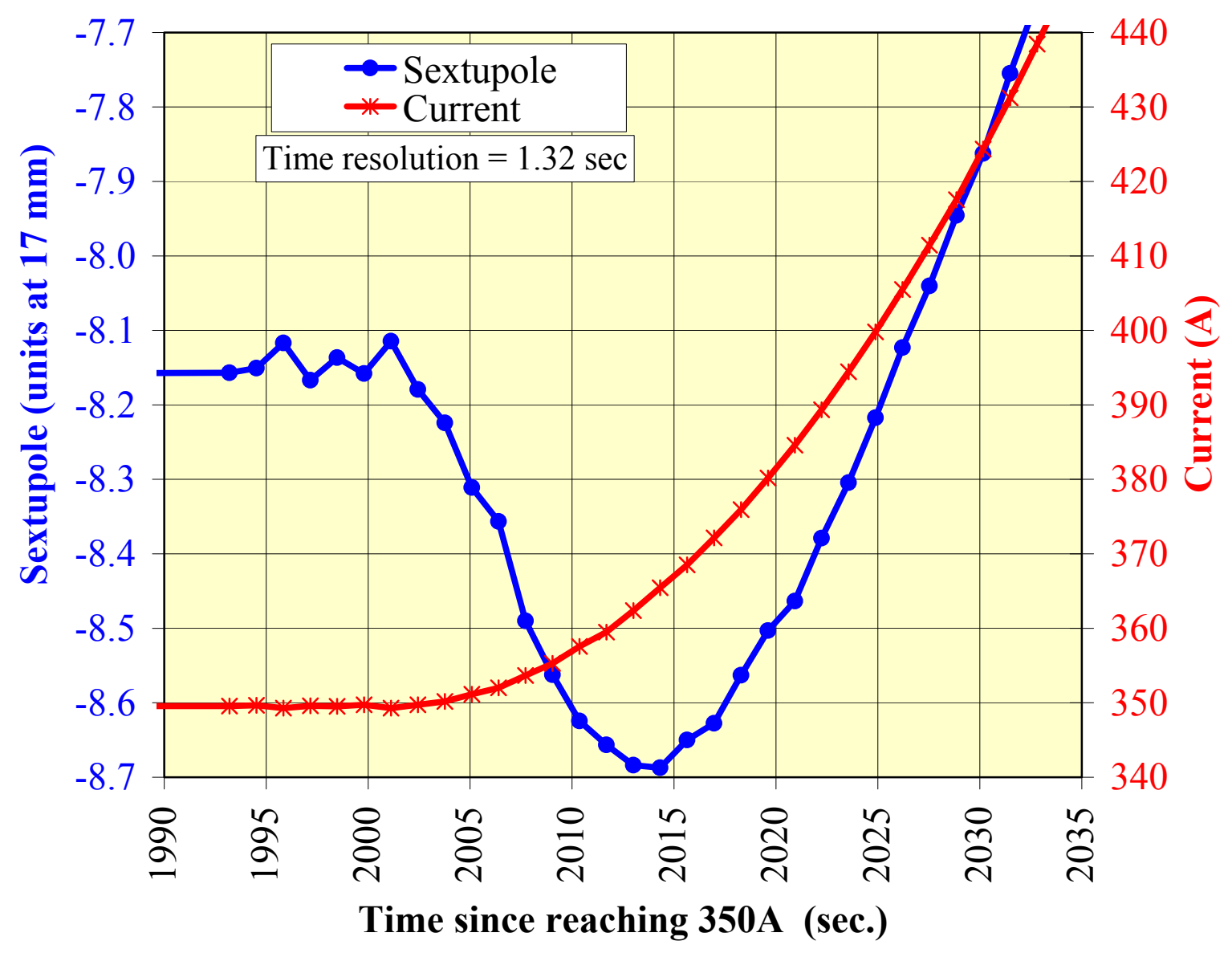
Sextupole Time Decay & Snap-back in D1L103

(Quadratic Ramp; 350A to 6500A at 20 A/s; Runs101 and 102)



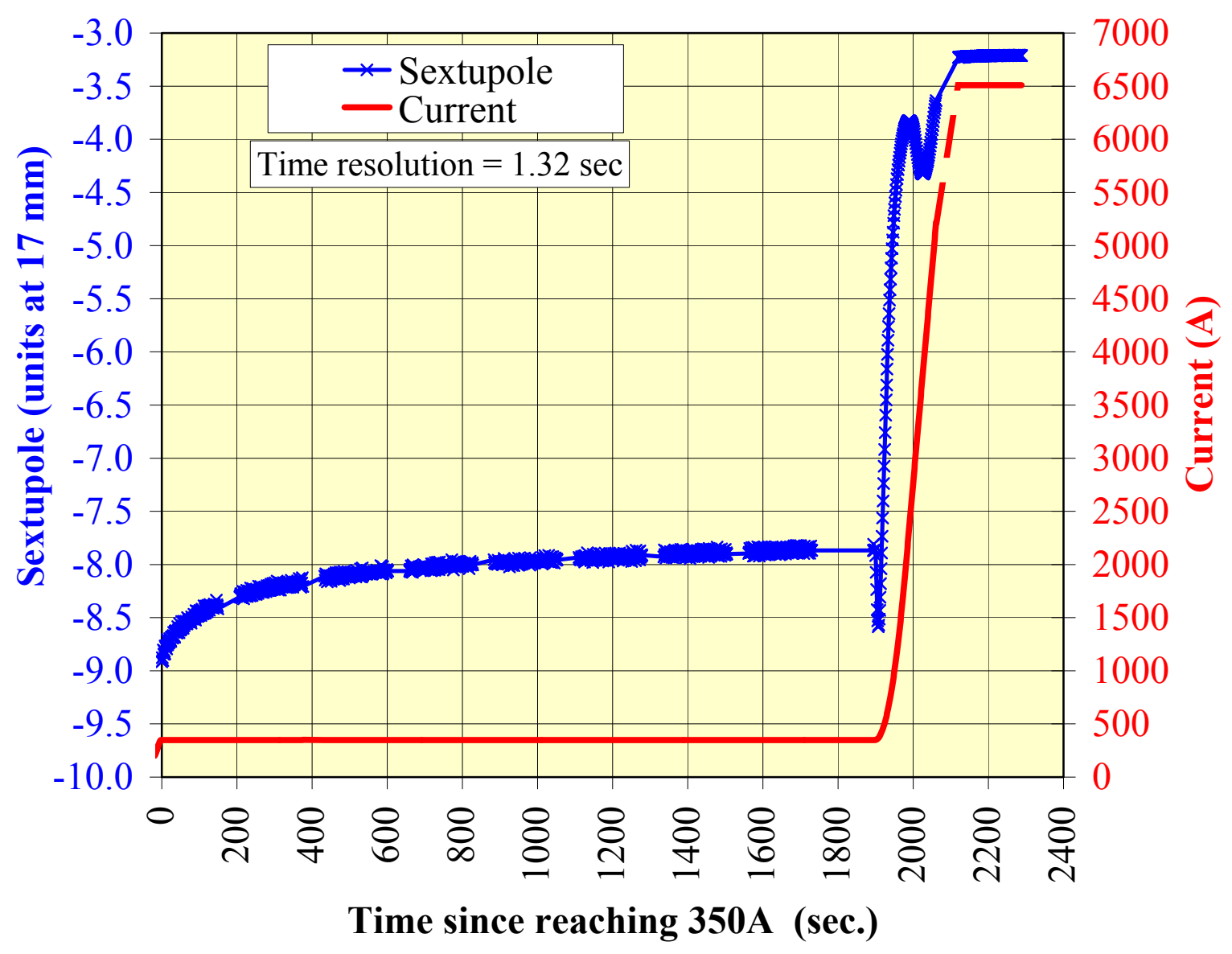
Sextupole Time Decay & Snap-back in D1L103

(Quadratic Ramp; 350A to 6500A at 20 A/s; Runs101 and 102)



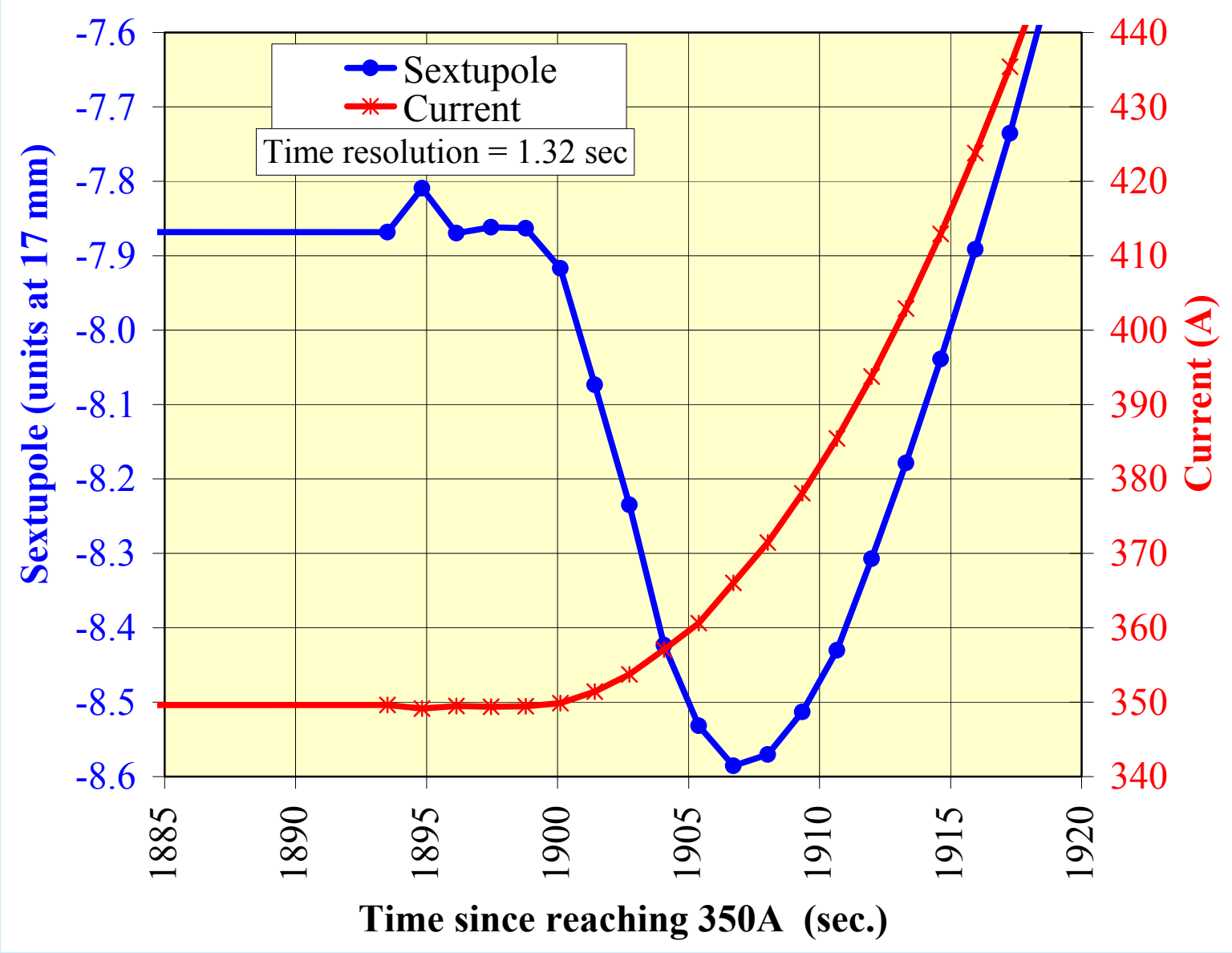
Sextupole Time Decay & Snap-back in D1L103

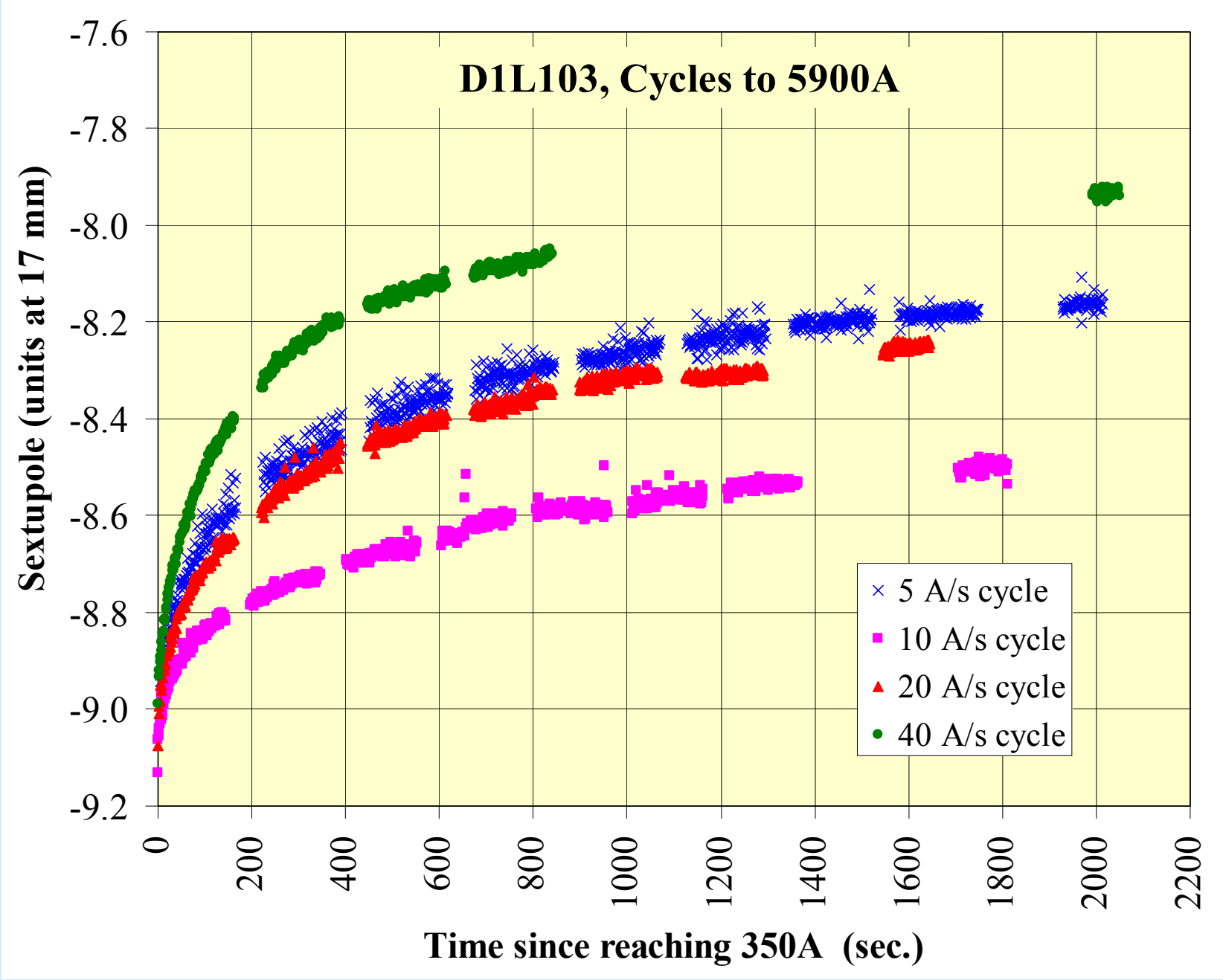
(Quadratic Ramp; 350A to 6500A at 40 A/s; Runs104 and 105)

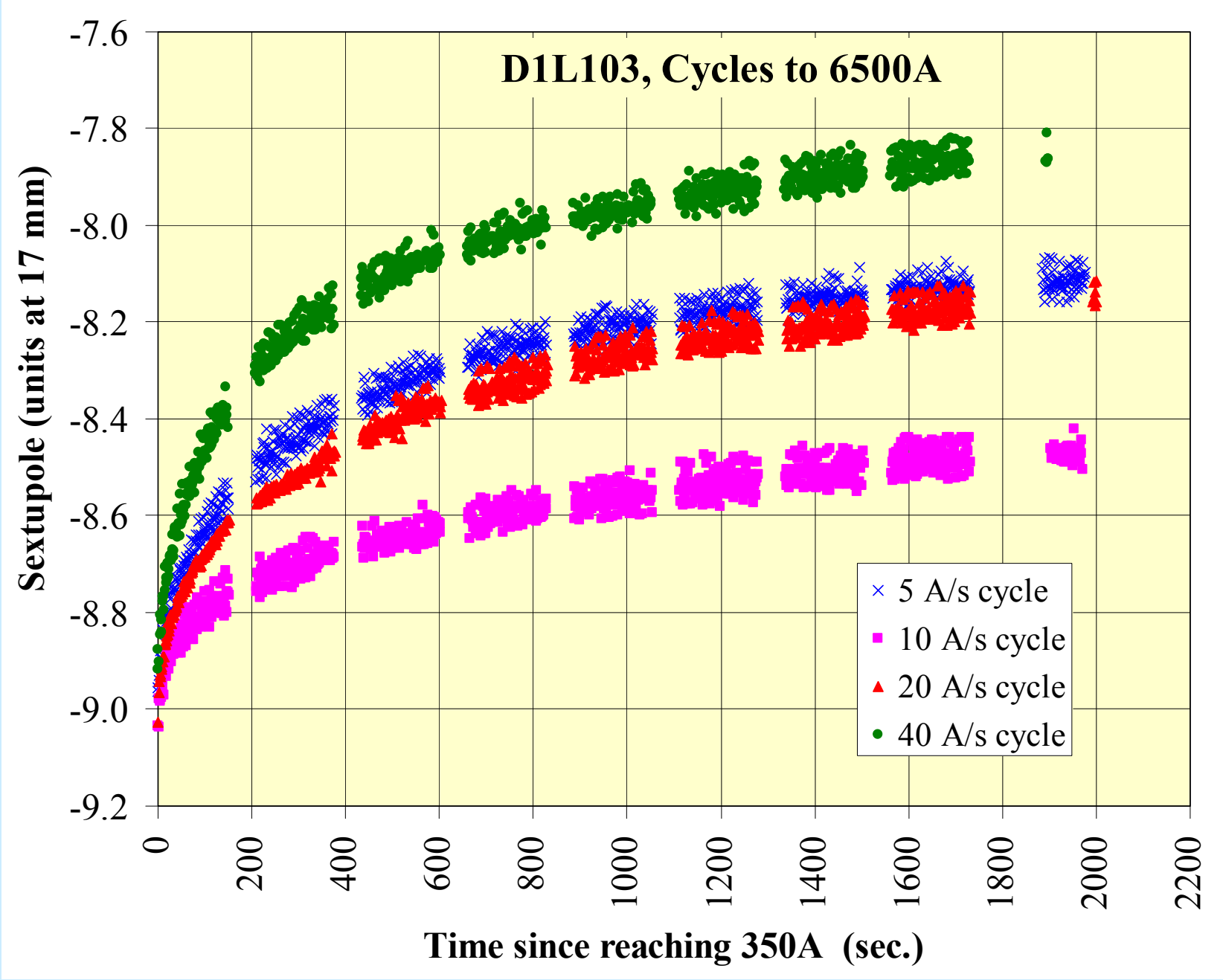


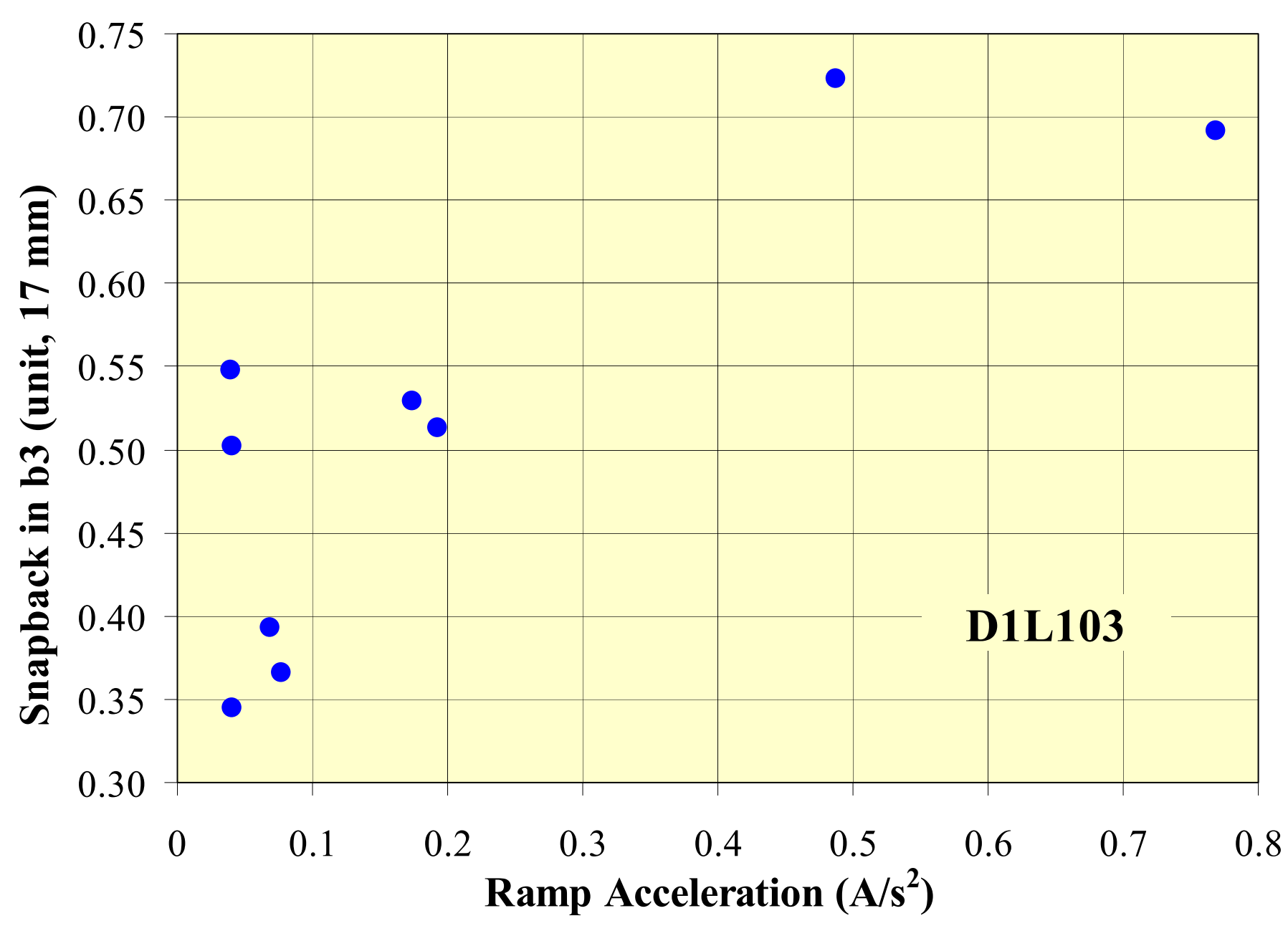
Sextupole Time Decay & Snap-back in D1L103

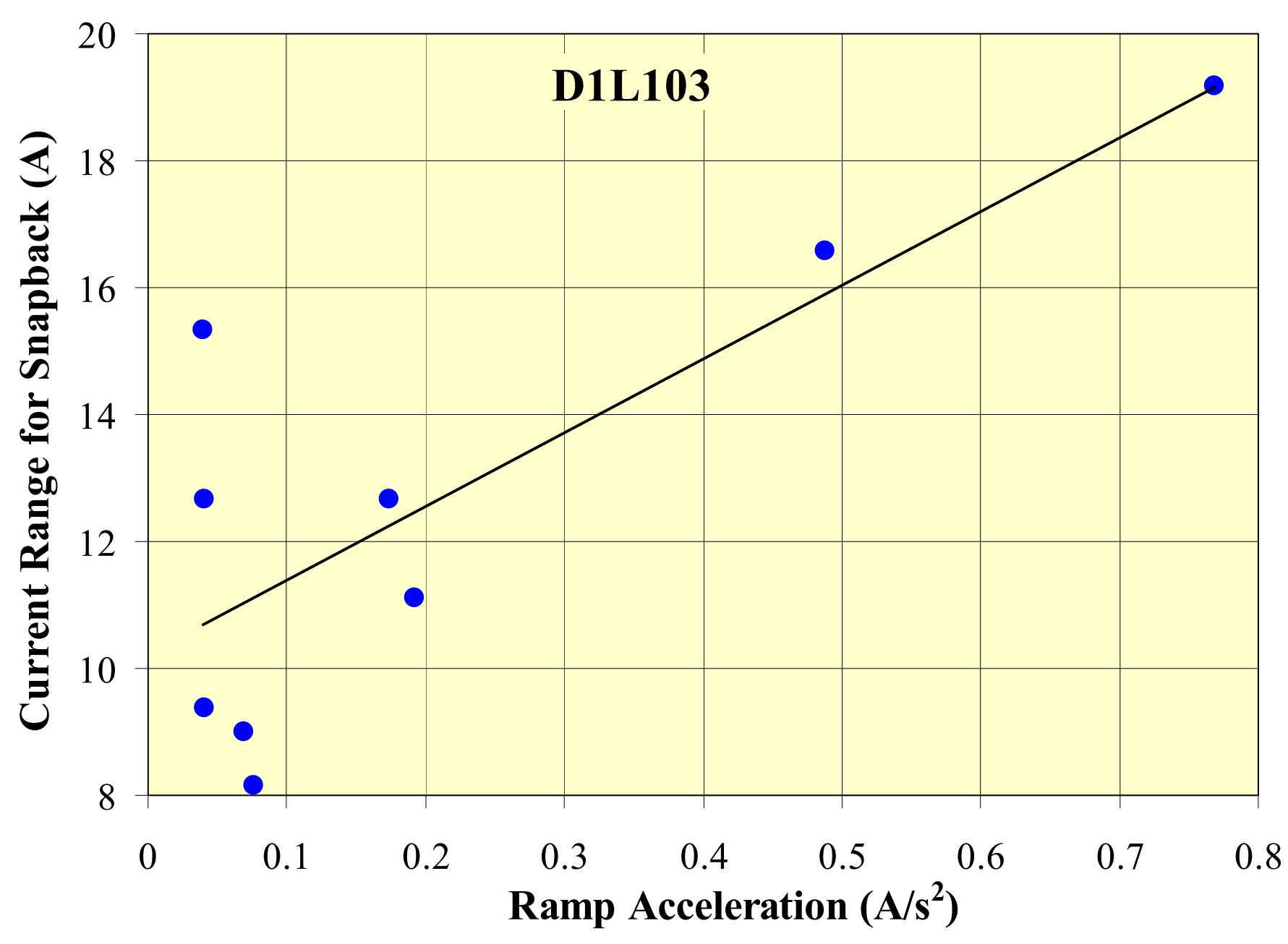
(Quadratic Ramp; 350A to 6500A at 40 A/s; Runs104 and 105)

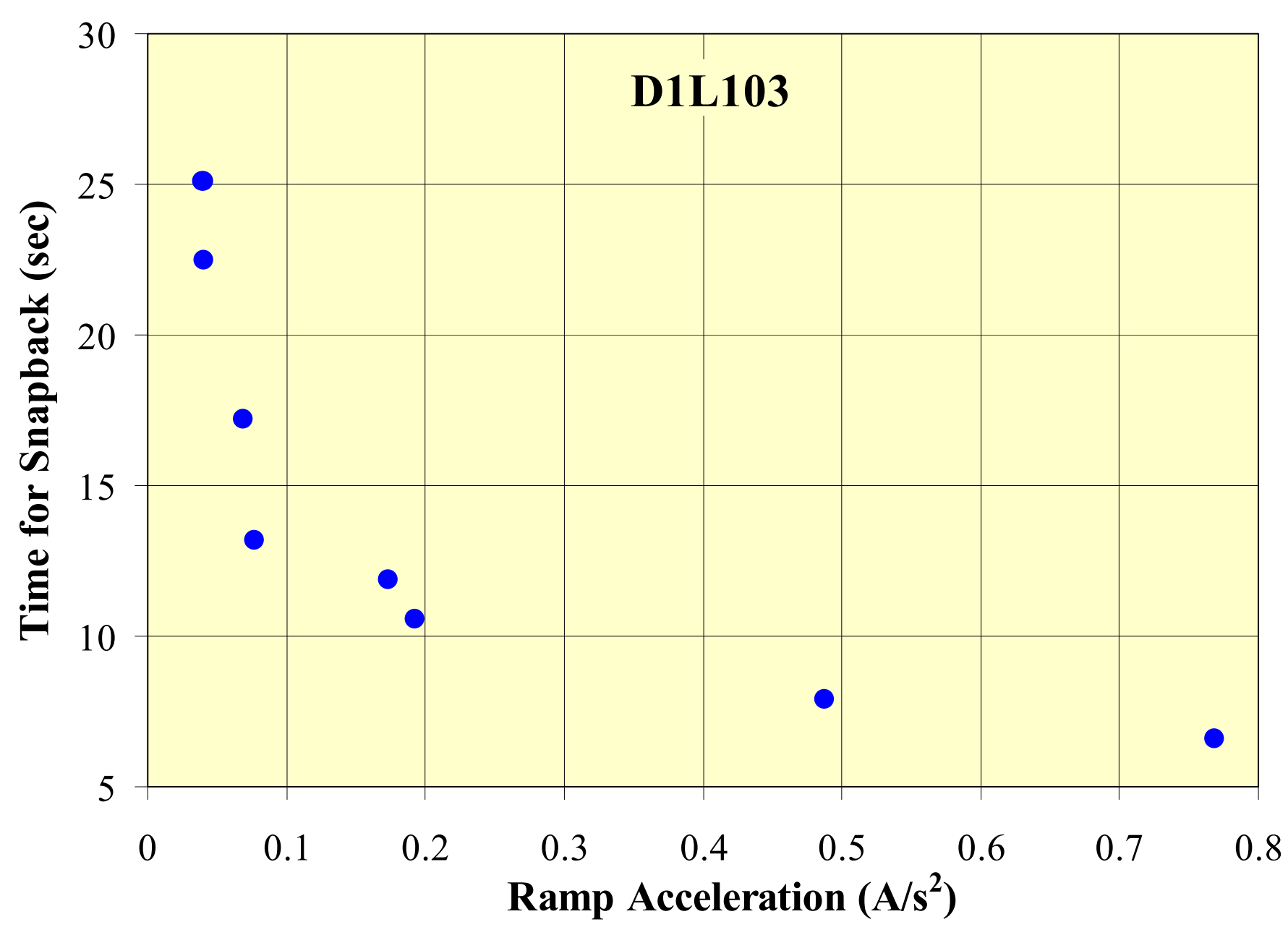



D1L103, Cycles to 5900A
Sextupole (units at 17 mm)
-7.6
-7.8
-8.0
-8.2
-8.4
-8.6
-8.8
-9.0
-9.2
0
200
400
600
800
1000
1200
1400
1600
1800
2000
2200
Time since reaching 350A (sec.)
5 A/s cycle
10 A/s cycle
20 A/s cycle
40 A/s cycle

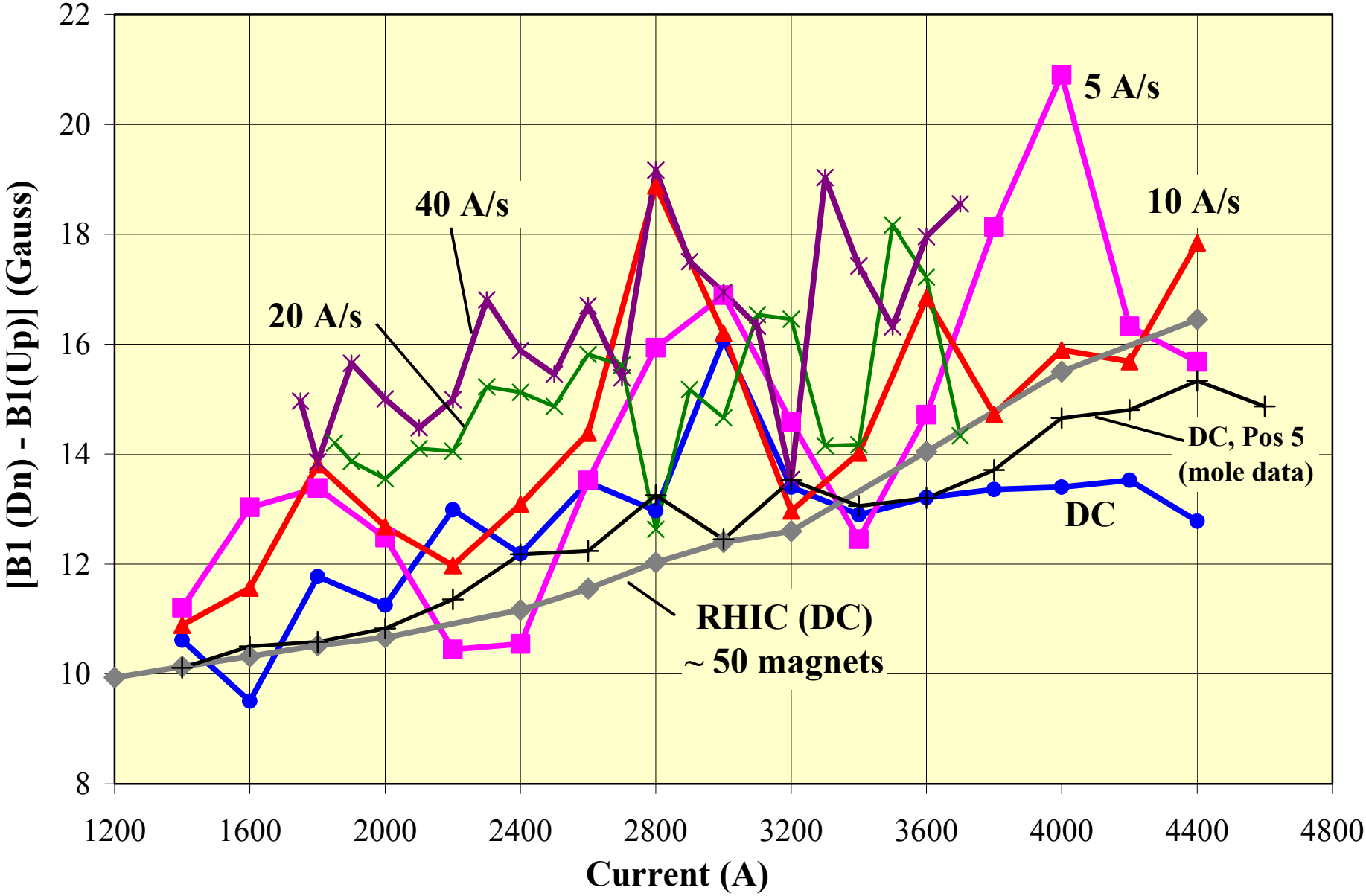

D1L103, Cycles to 6500A
Sextupole (units at 17 mm)
-7.6
-7.8
-8.0
-8.2
-8.4
-8.6
-8.8
-9.0
-9.2
0
200
400
600
800
1000
1200
1400
1600
1800
2000
2200
Time since reaching 350A (sec.)
5 A/s cycle
10 A/s cycle
20 A/s cycle
40 A/s cycle


0.75
0.70
0.65
0.60
0.55
0.50
0.45
0.40
0.35
0.30
Snapback in b3 (unit, 17 mm)
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
Ramp Acceleration (A/s2)
D1L103

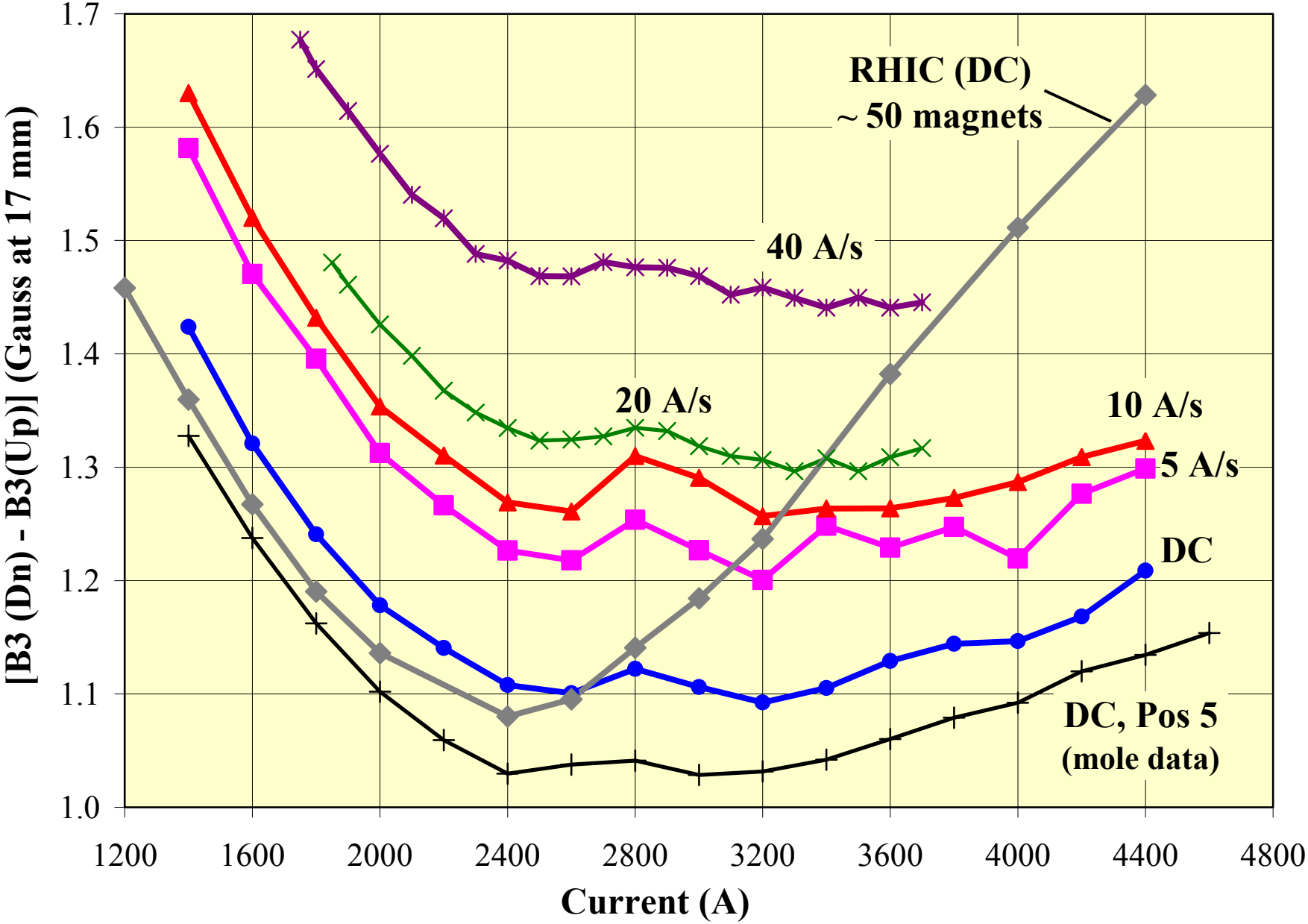
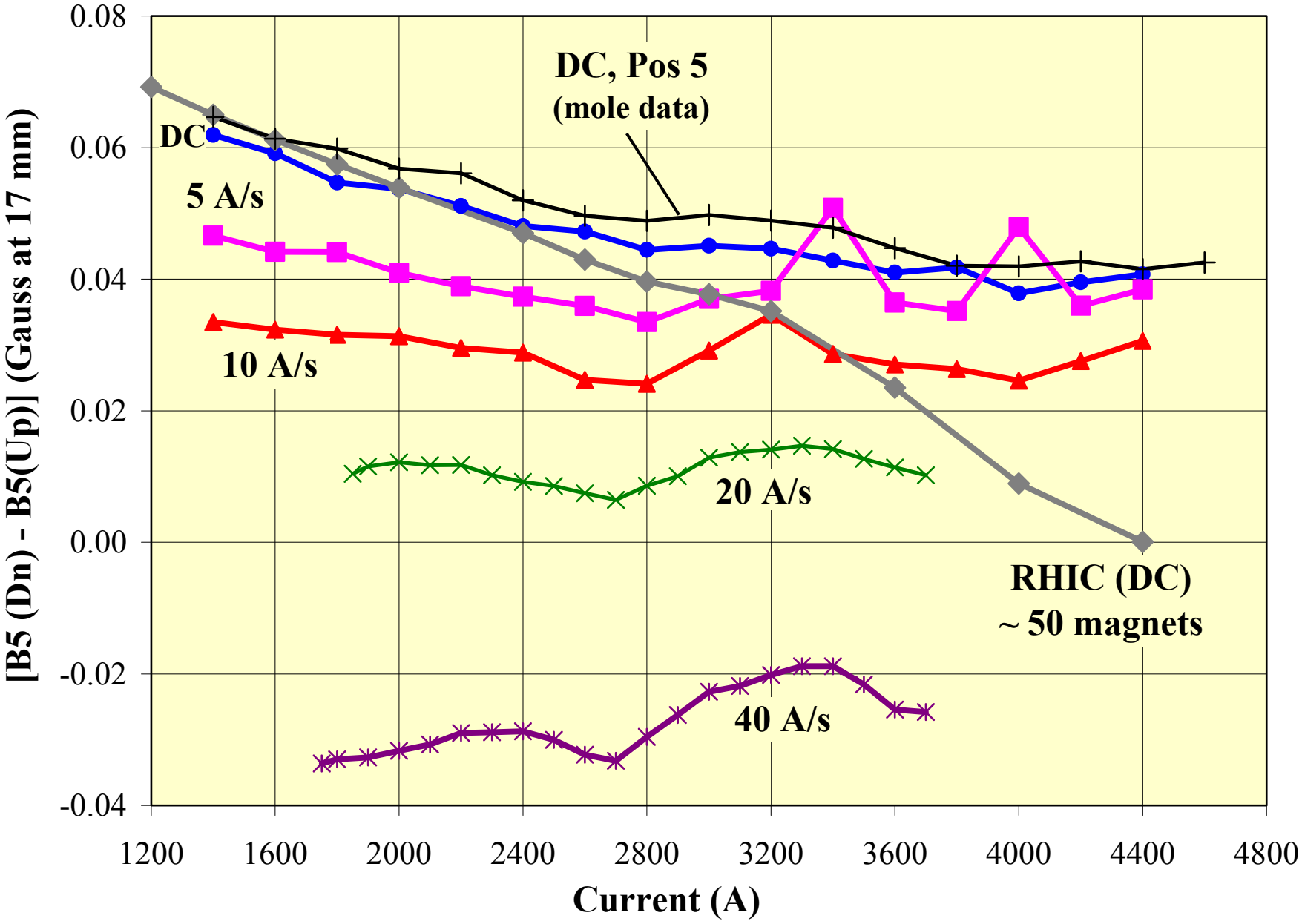

D1L103
Current Range for Snapback (A)
20
18
16
14
12
10
8
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
Ramp Acceleration (A/s2)


D1L103
Time for Snapback (sec)
30
25
20
15
10
5
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
Ramp Acceleration (A/s2)

D1L103: Ramp rate & Magnetization Effects



D1L103: Ramp rate & Magnetization Effects



D1L103: Ramp rate & Magnetization Effects