Status of SNS Linac Magnet Tests at ORNL

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AP Video Meeting
February 24, 2004

Acknowledgement:
Ted Hunter (Team Leader), Steve Heimsoth, Doug LeBon, Robert McBrien

SNS Linac Magnet Tests at ORNL

- DTL Dipole Correctors (EMD): 2.8D2.25
  24 (completed) / 24 (needed)

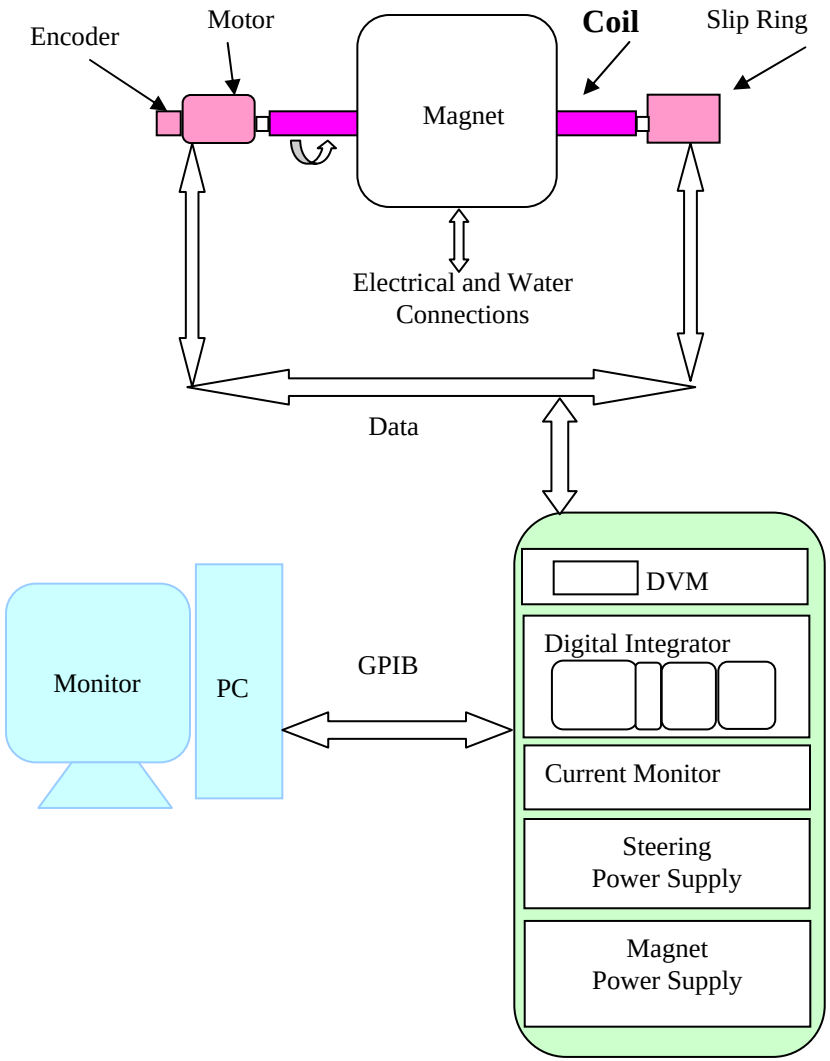
- DTL Quads (PMQ): (R=1.229 cm, L=1.378 cm)
  139/140

- CCL Quads: R177QN80, R175QN45, R24QN80
  38 (?)/50

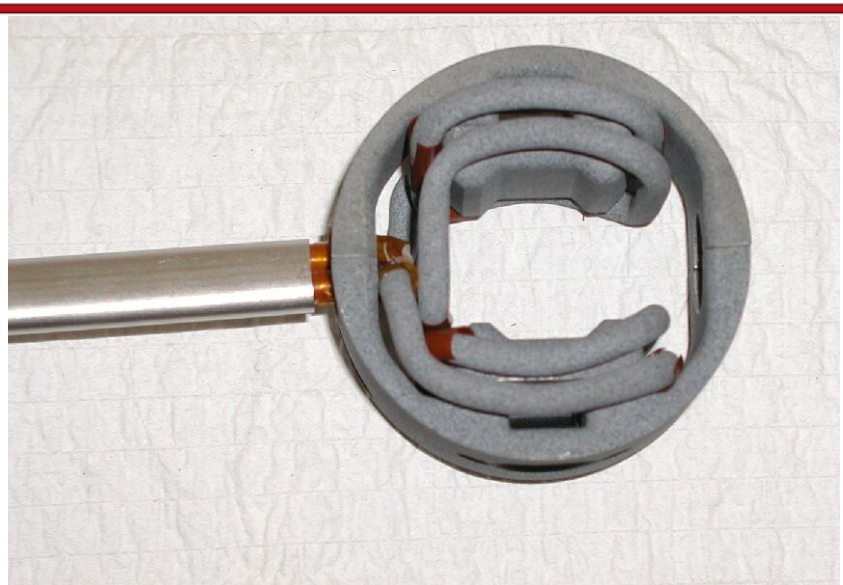
- SCL Quads: 8Q35
  1/64

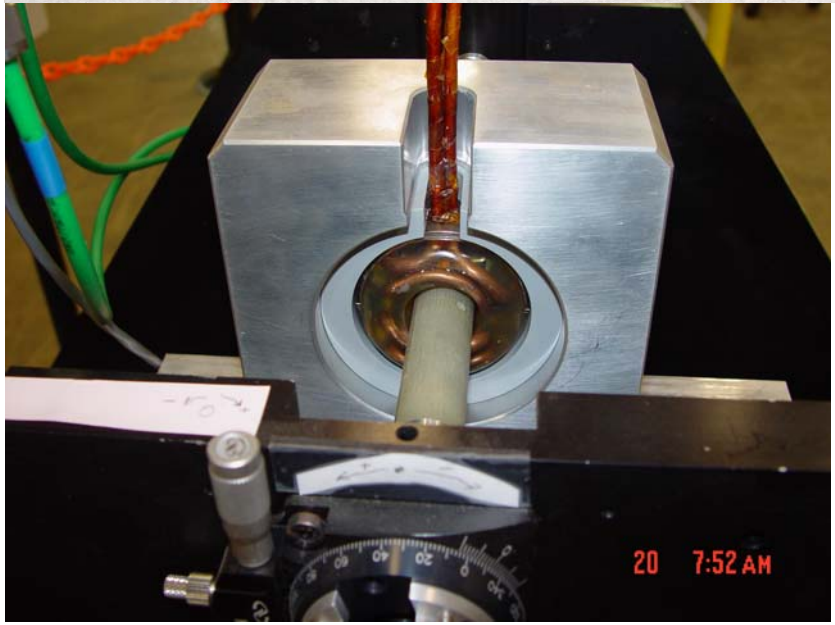
SNS Linac Magnet Test Systems

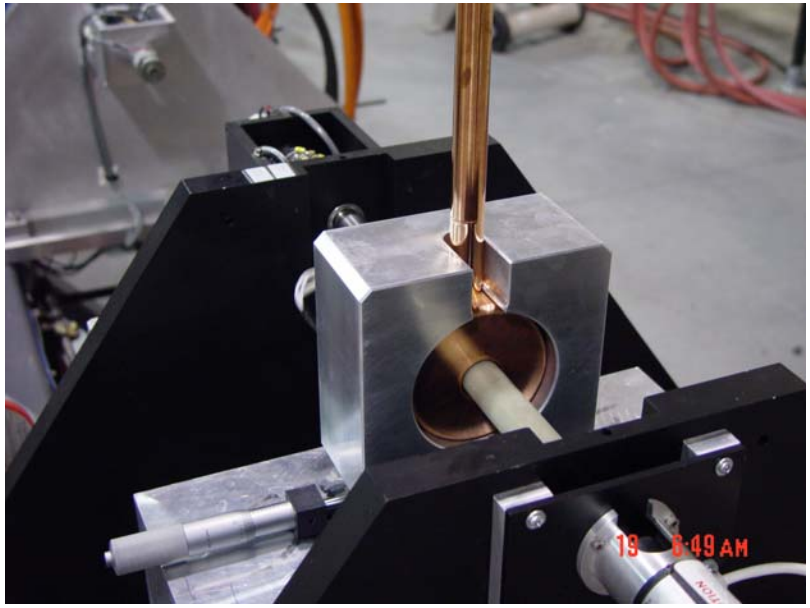
- **Test Stands:**
  - DTL/CCL Magnet
  - SCL Magnet
- **Rotating Coils:**
- **Electronics:**
  - Metrolab PDI 5025
  - Group3 DTM-151
  - Keithley DVM 2700
  - Power Supplies
  - ….
- **Software:**
  - **Labview**



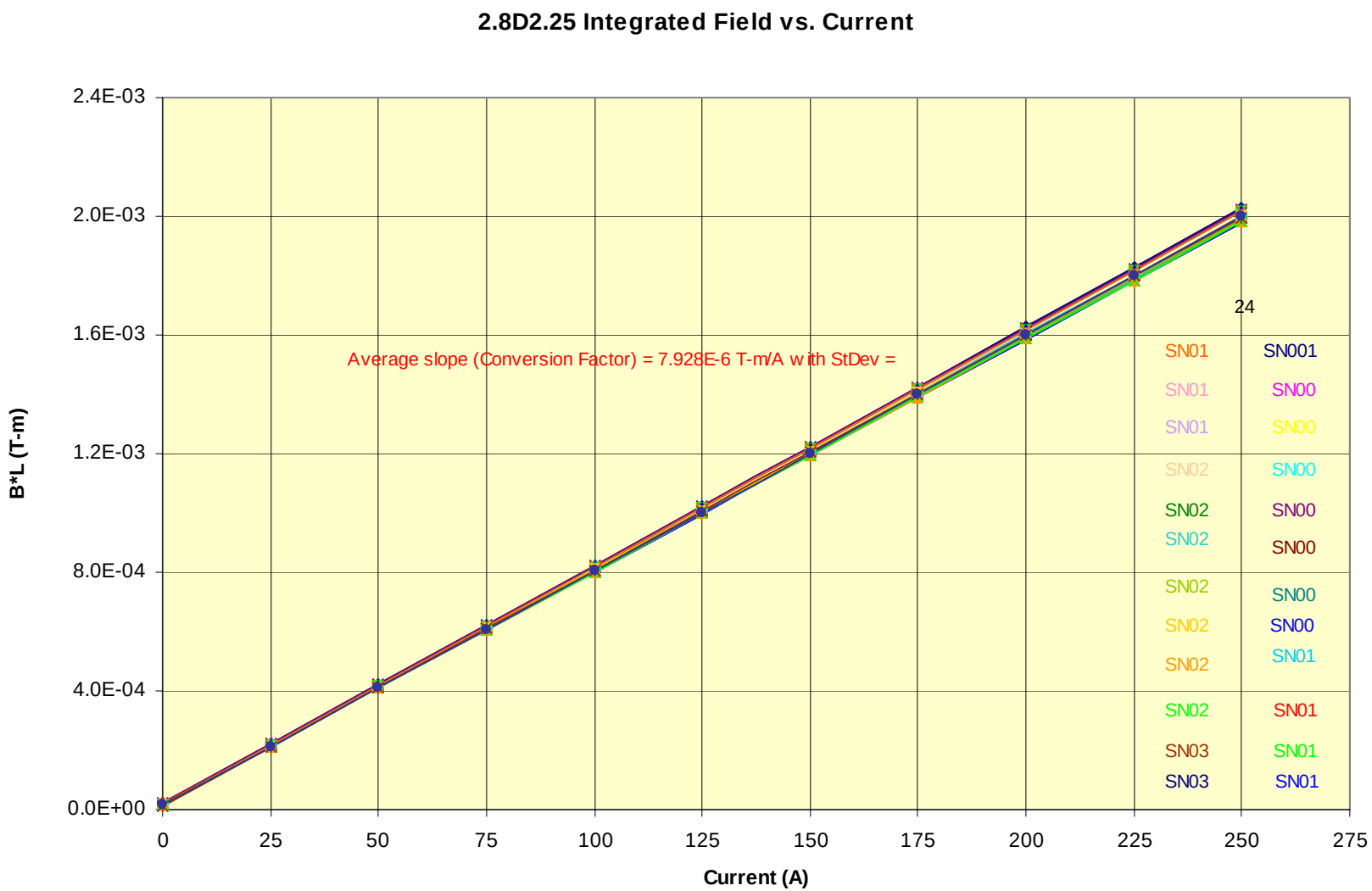
DTL EMD Measurement



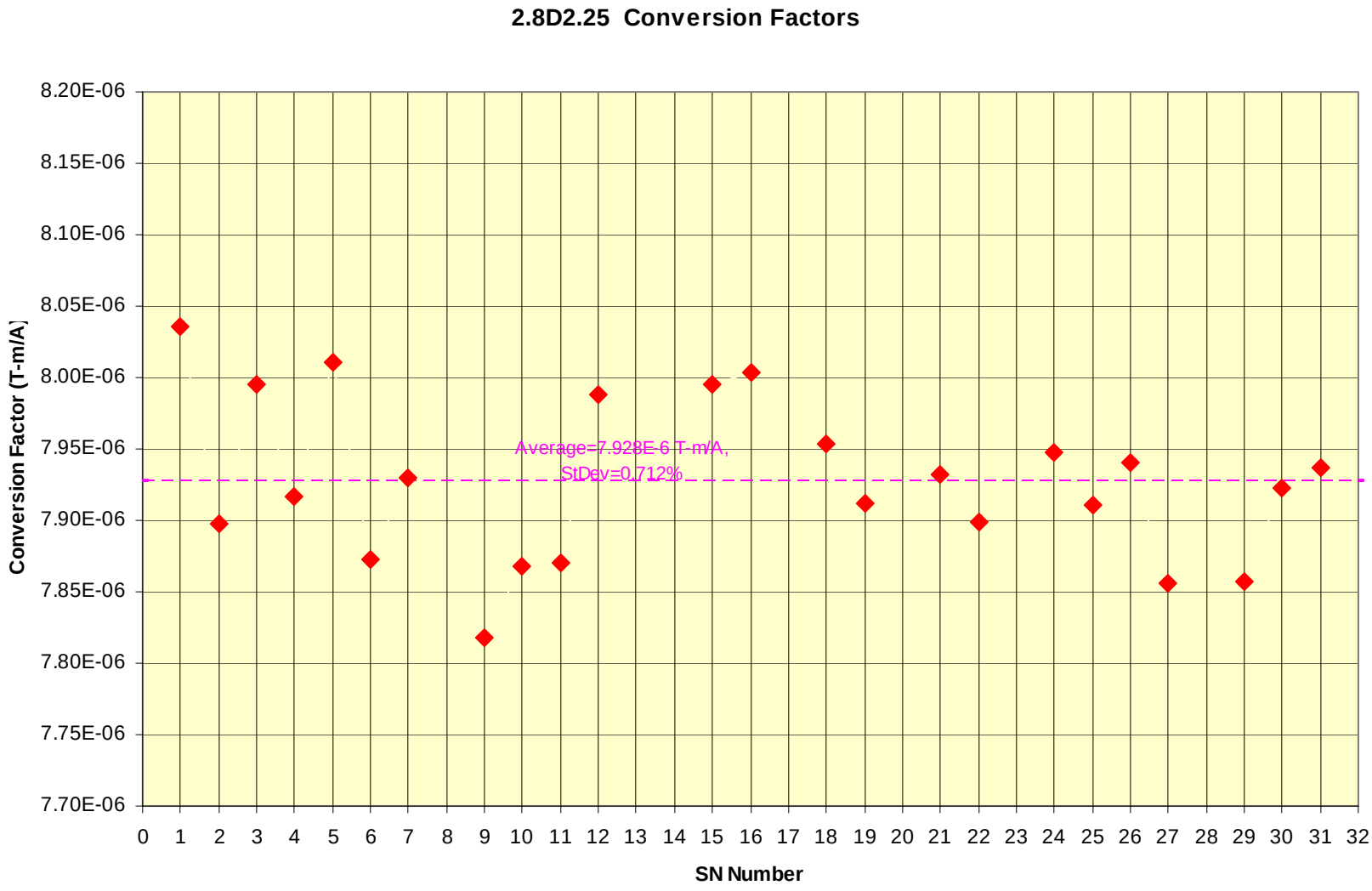




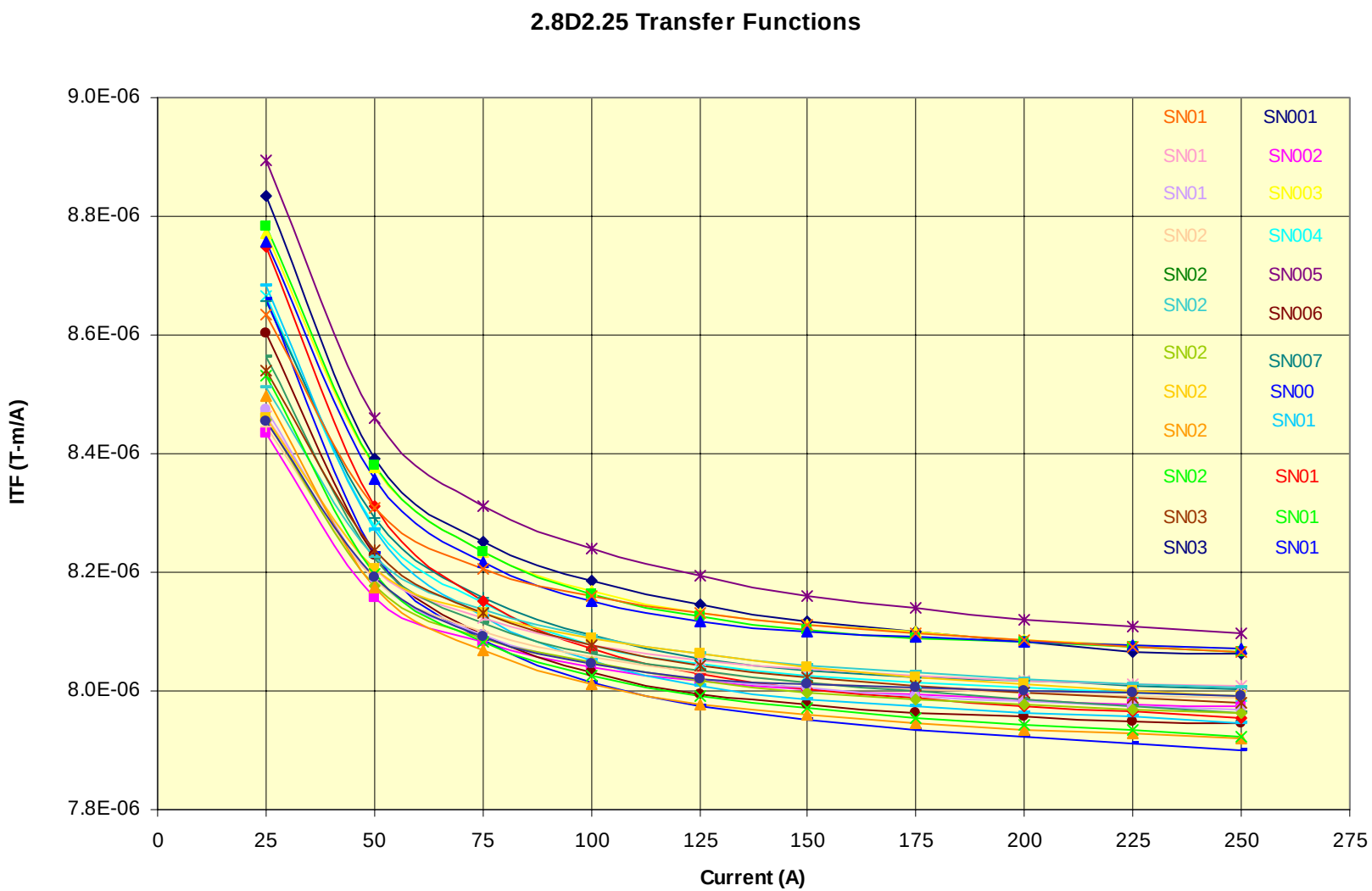
DTL EMD: Integrated Field vs. Current



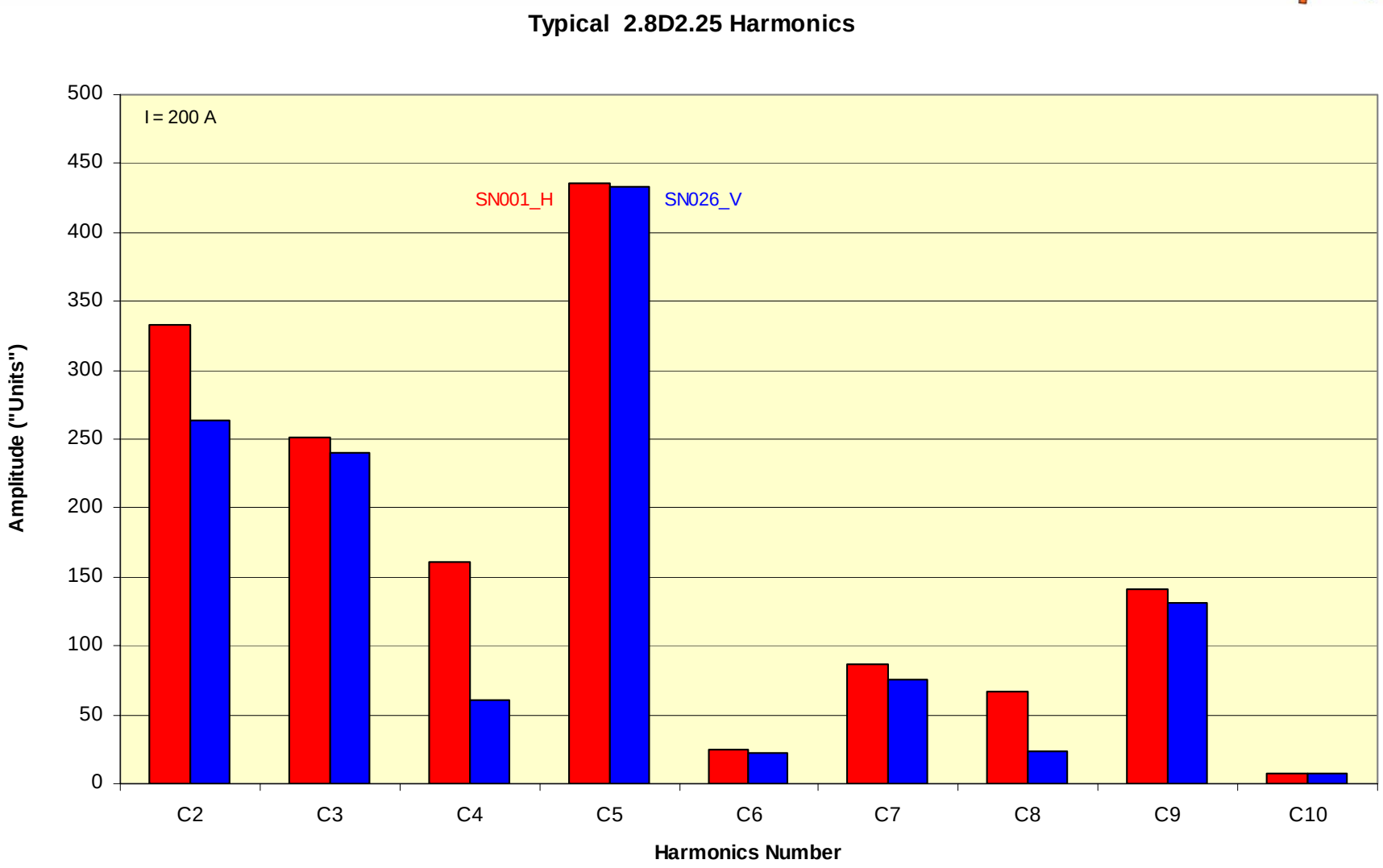
DTL EMD: Conversion Factors



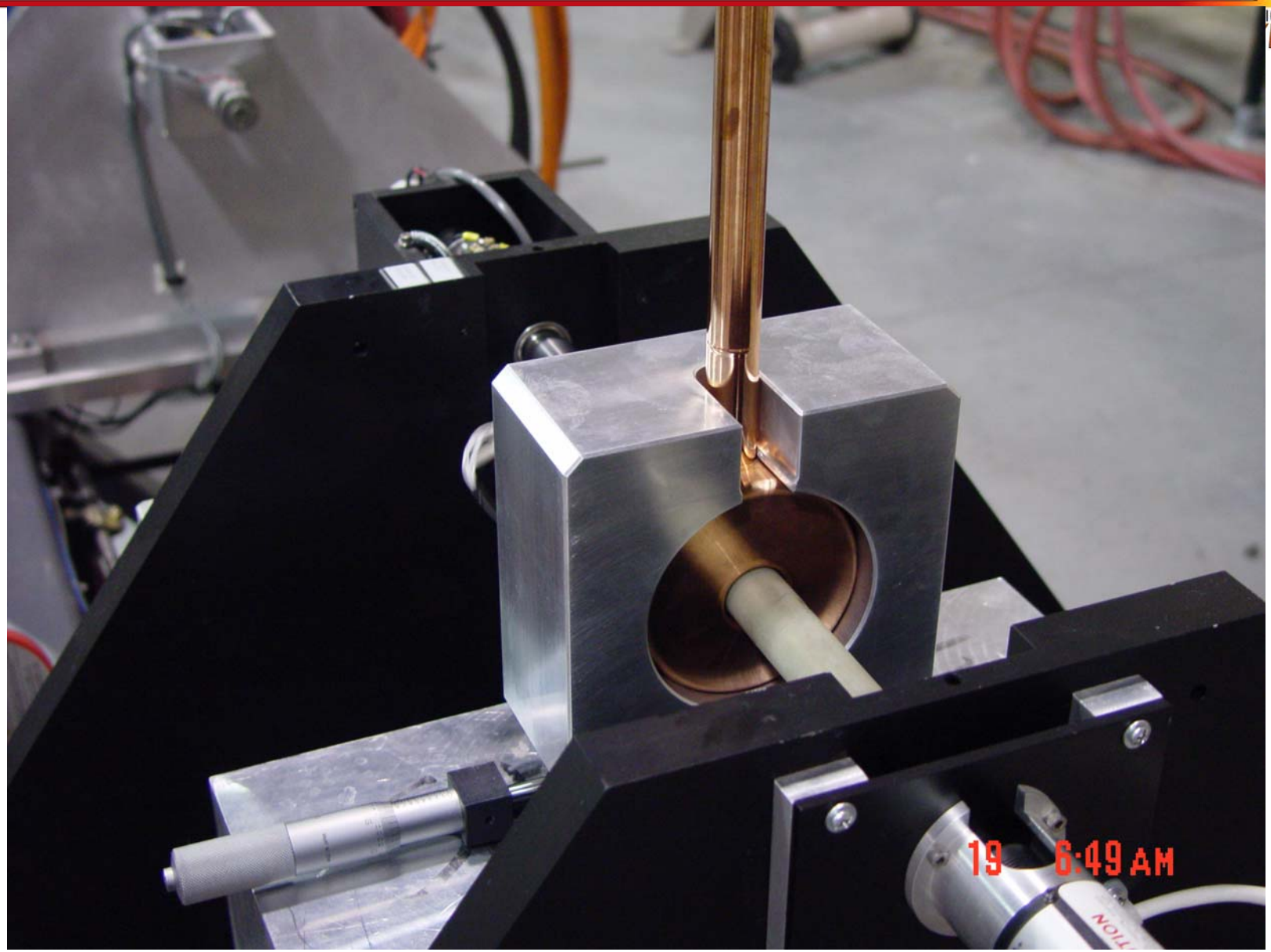
DTL EMD: Integrated Transfer Functions



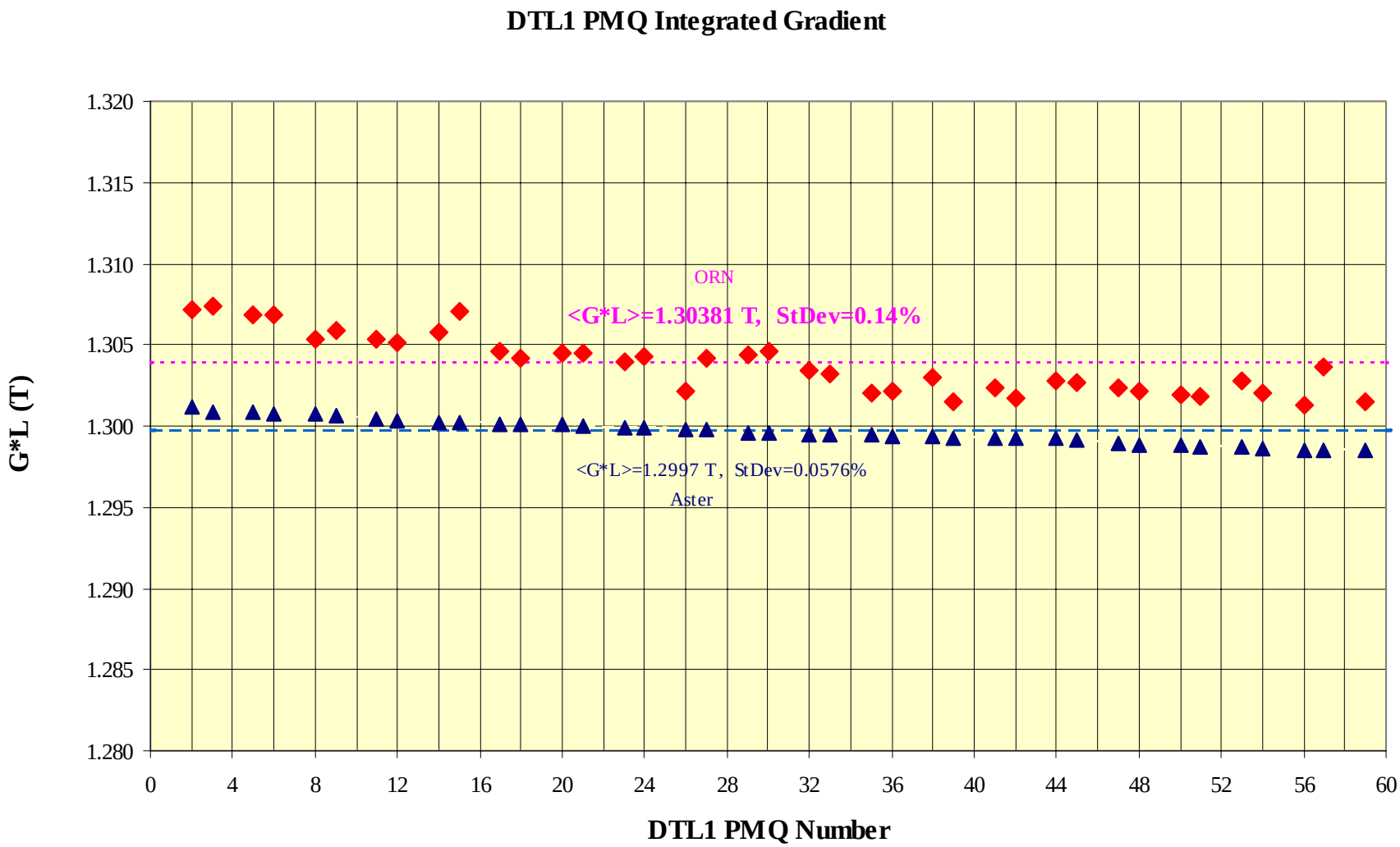
DTL EMD: Typical Harmonics



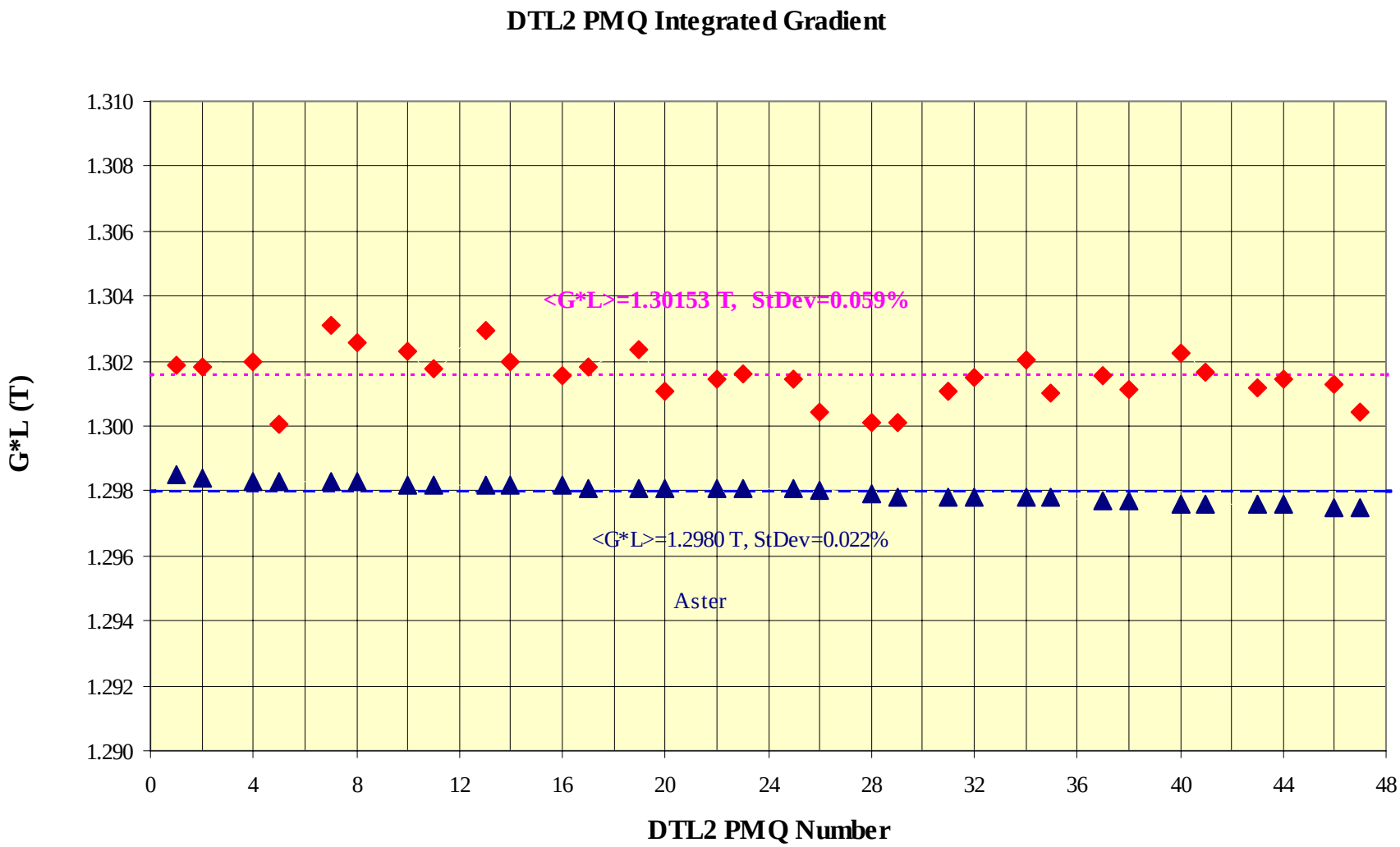
DTL PMQ Measurement



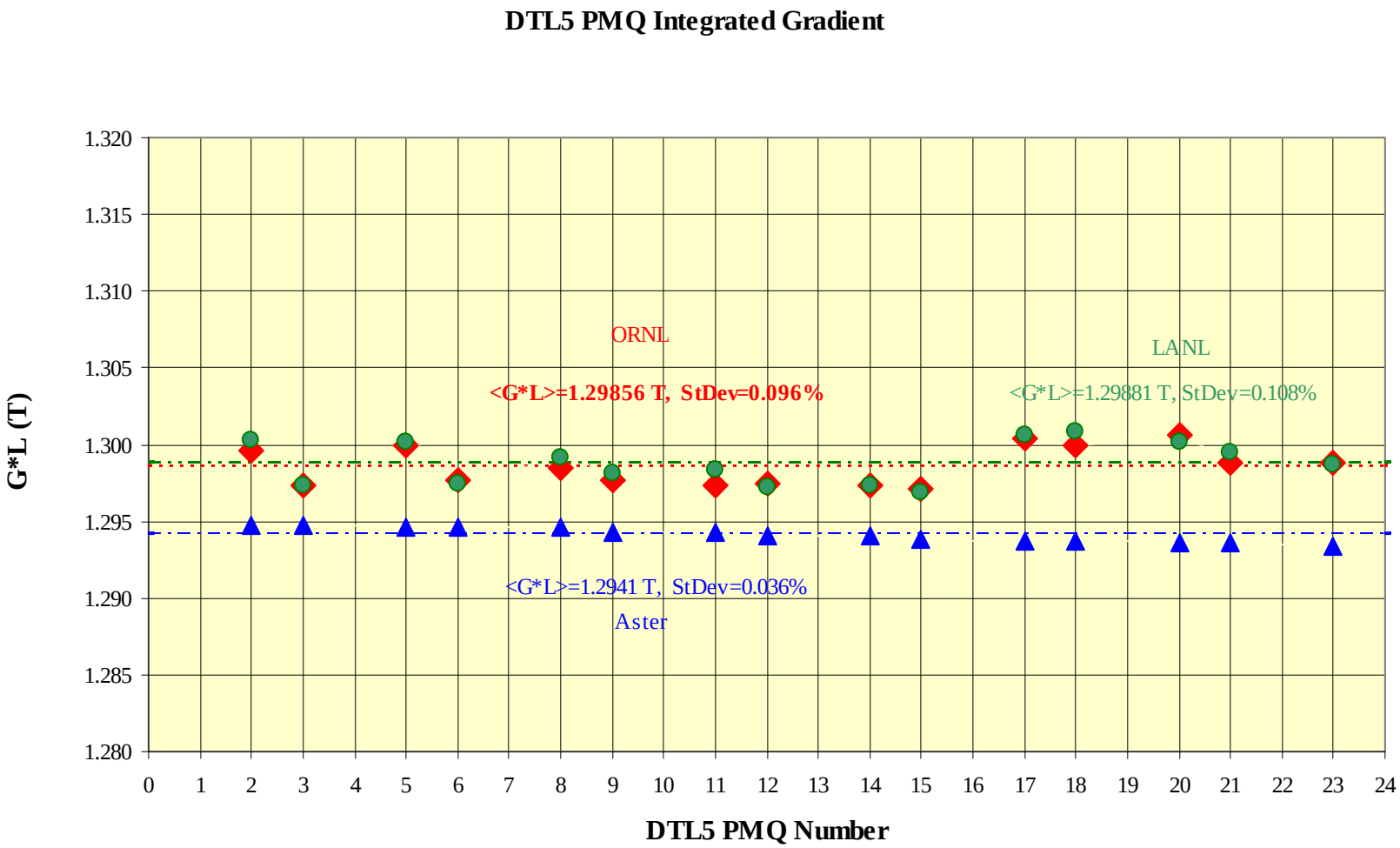
DTL1 PMQ Integrated Gradient



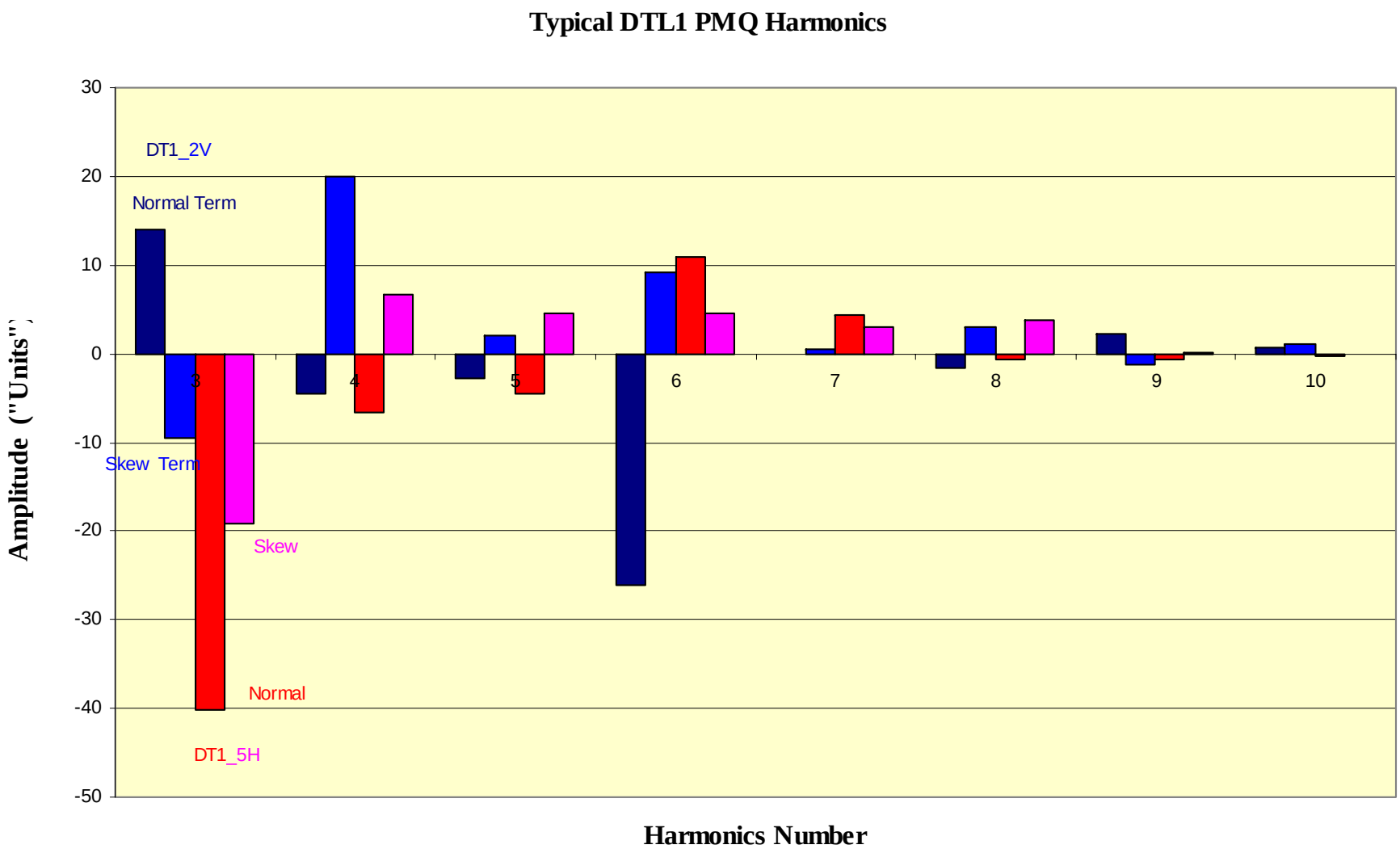
DTL2 PMQ Integrated Gradient



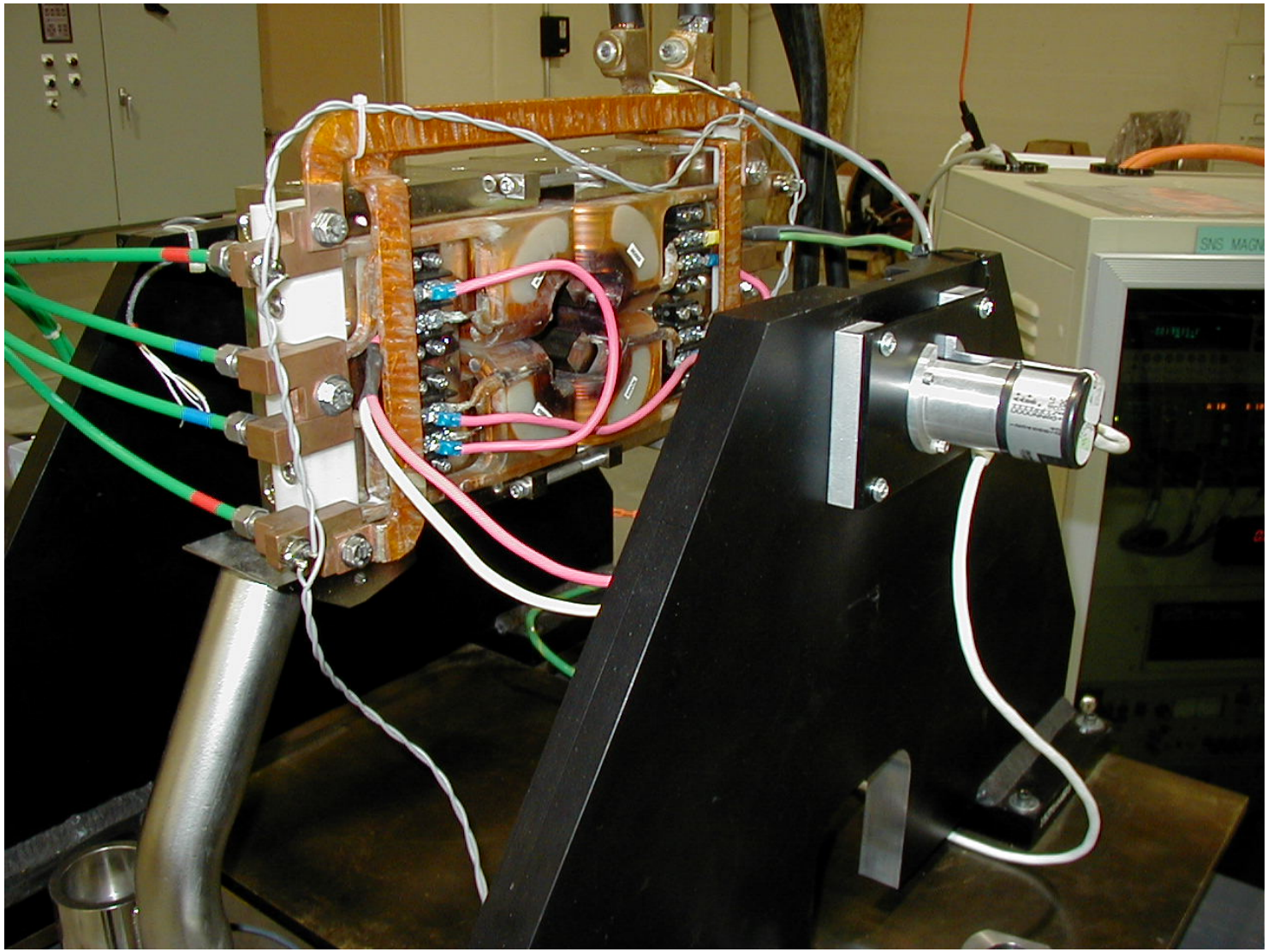
DTL5 PMQ Integrated Gradient



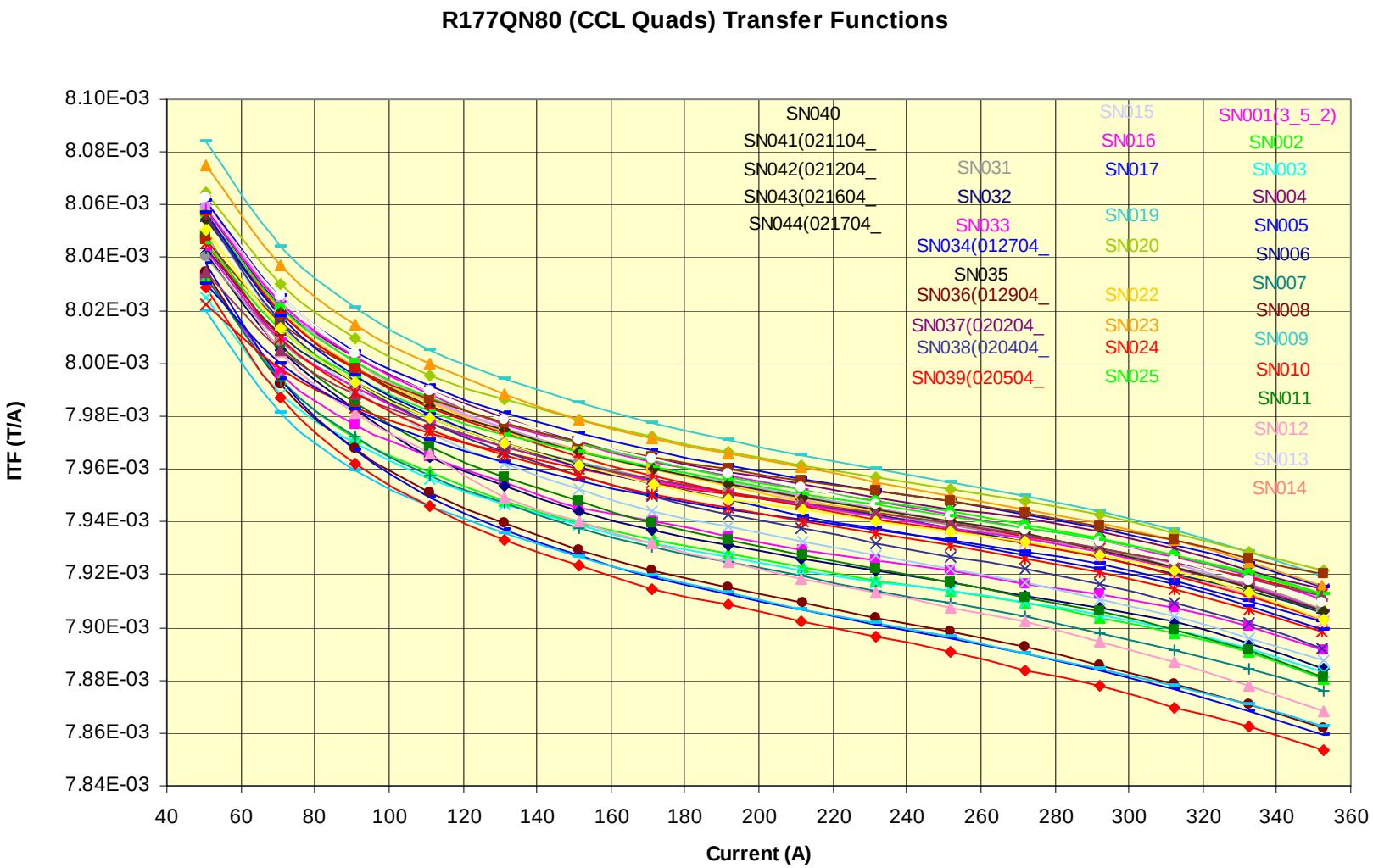
DTL PMQ Typical Harmonics



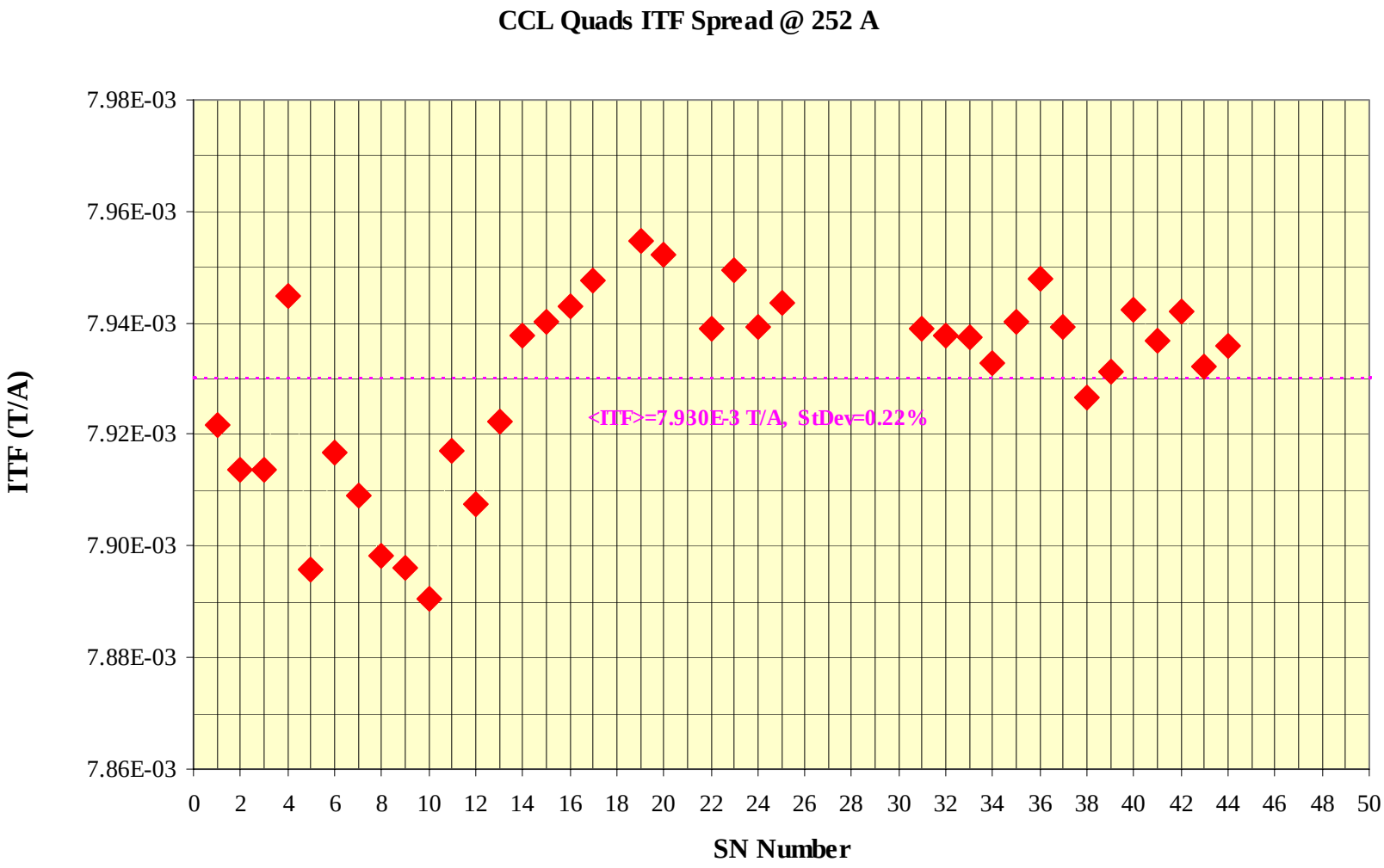
CCL Quad Measurement



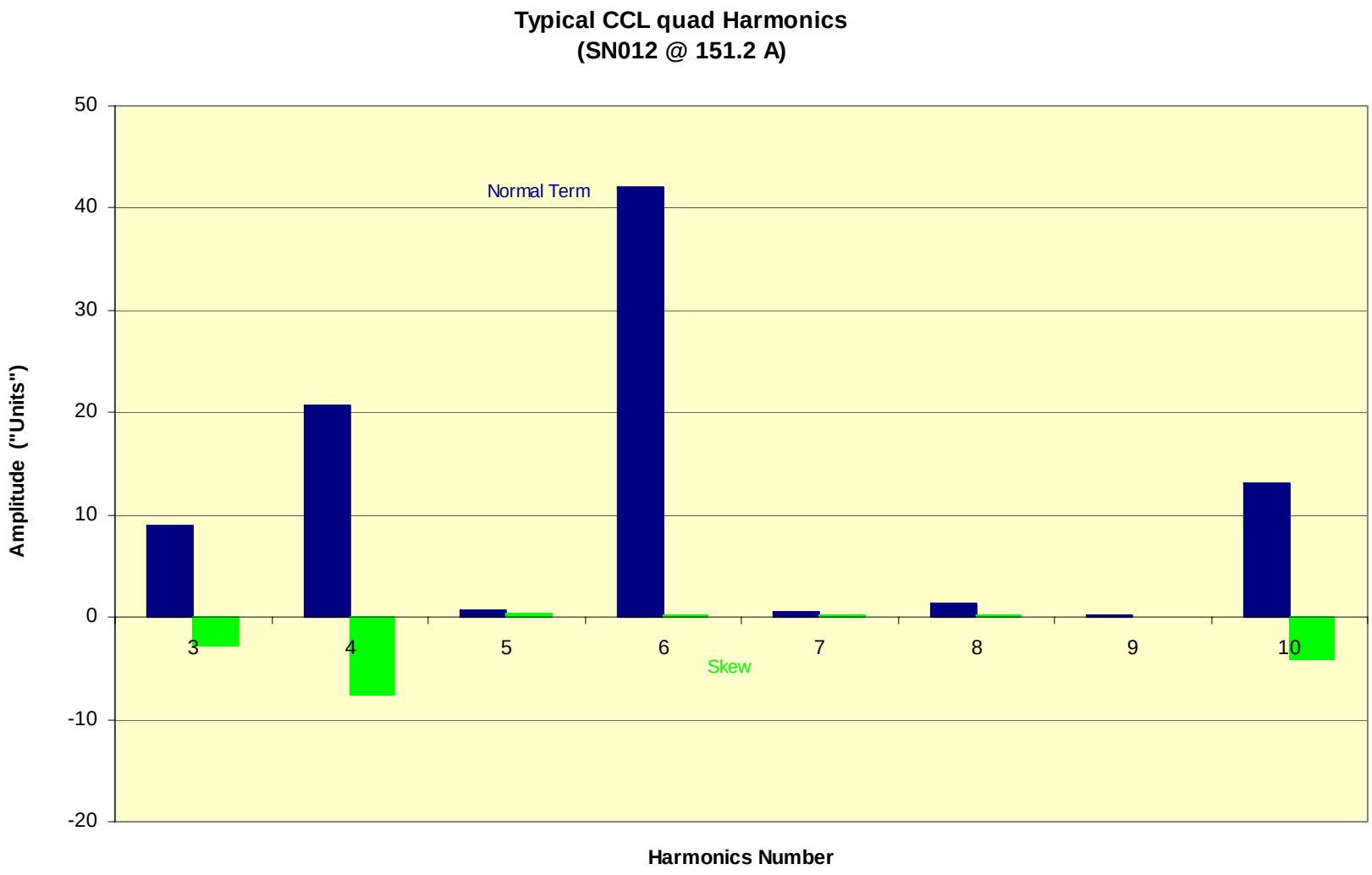
CCL Quad ITF

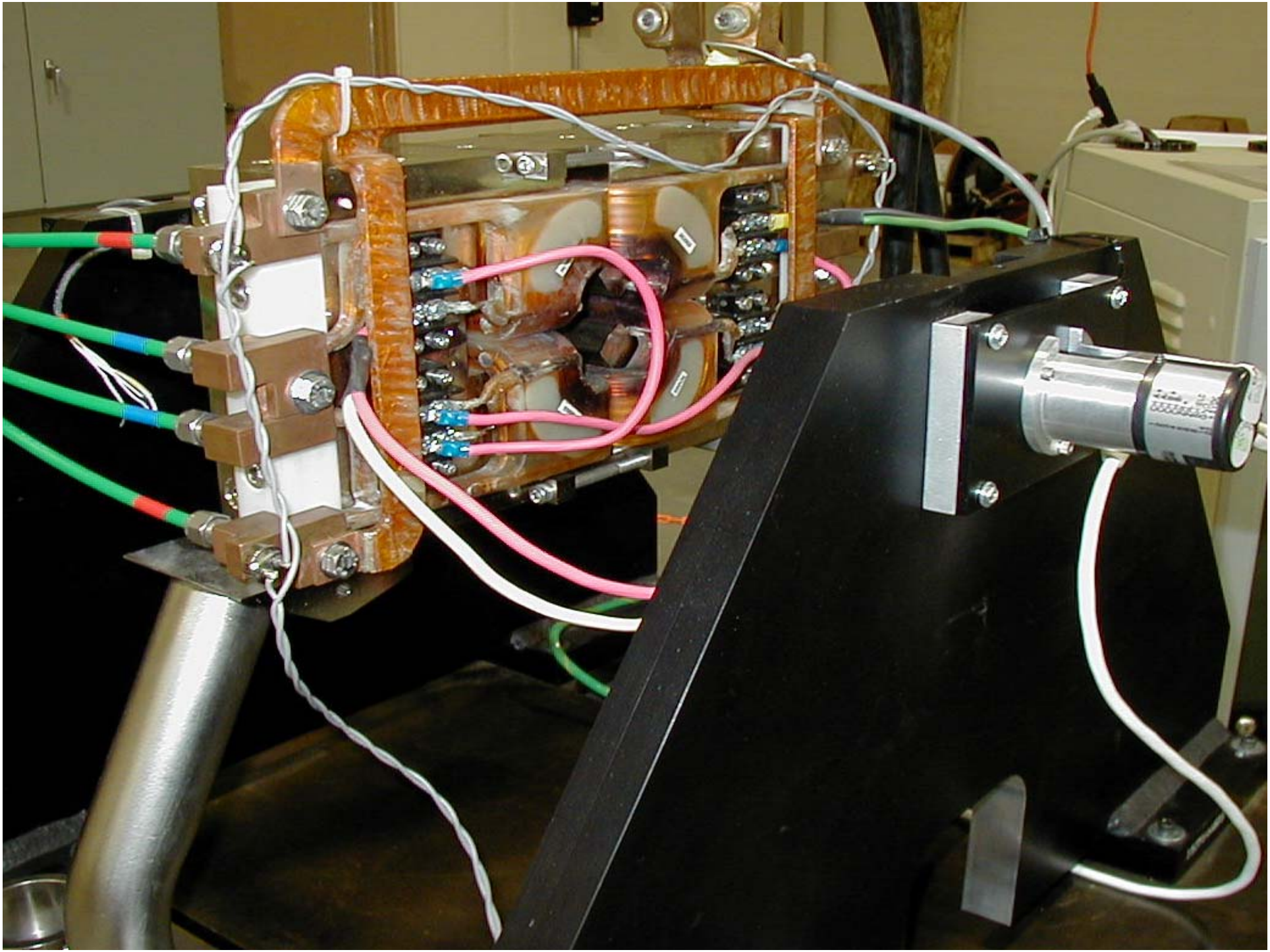

R177QN80 (CCL Quads) Transfer Functions
ITF (T/A)
8.10E-03
8.08E-03
8.06E-03
8.04E-03
8.02E-03
8.00E-03
7.98E-03
7.96E-03
7.94E-03
7.92E-03
7.90E-03
7.88E-03
7.86E-03
7.84E-03
40
60
80
100
120
140
160
180
200
220
240
260
280
300
320
340
360
Current (A)
SN040
SN041(021104_
SN042(021204_
SN043(021604_
SN044(021704_
SN031
SN032
SN033
SN034(012704_
SN035
SN036(012904_
SN037(020204_
SN038(020404_
SN039(020504_
SN015
SN016
SN017
SN019
SN020
SN022
SN023
SN024
SN025
SN001(3_5_2)
SN002
SN003
SN004
SN005
SN006
SN007
SN008
SN009
SN010
SN011
SN012
SN013
SN014

CCL Quad ITF Spread at 252 A

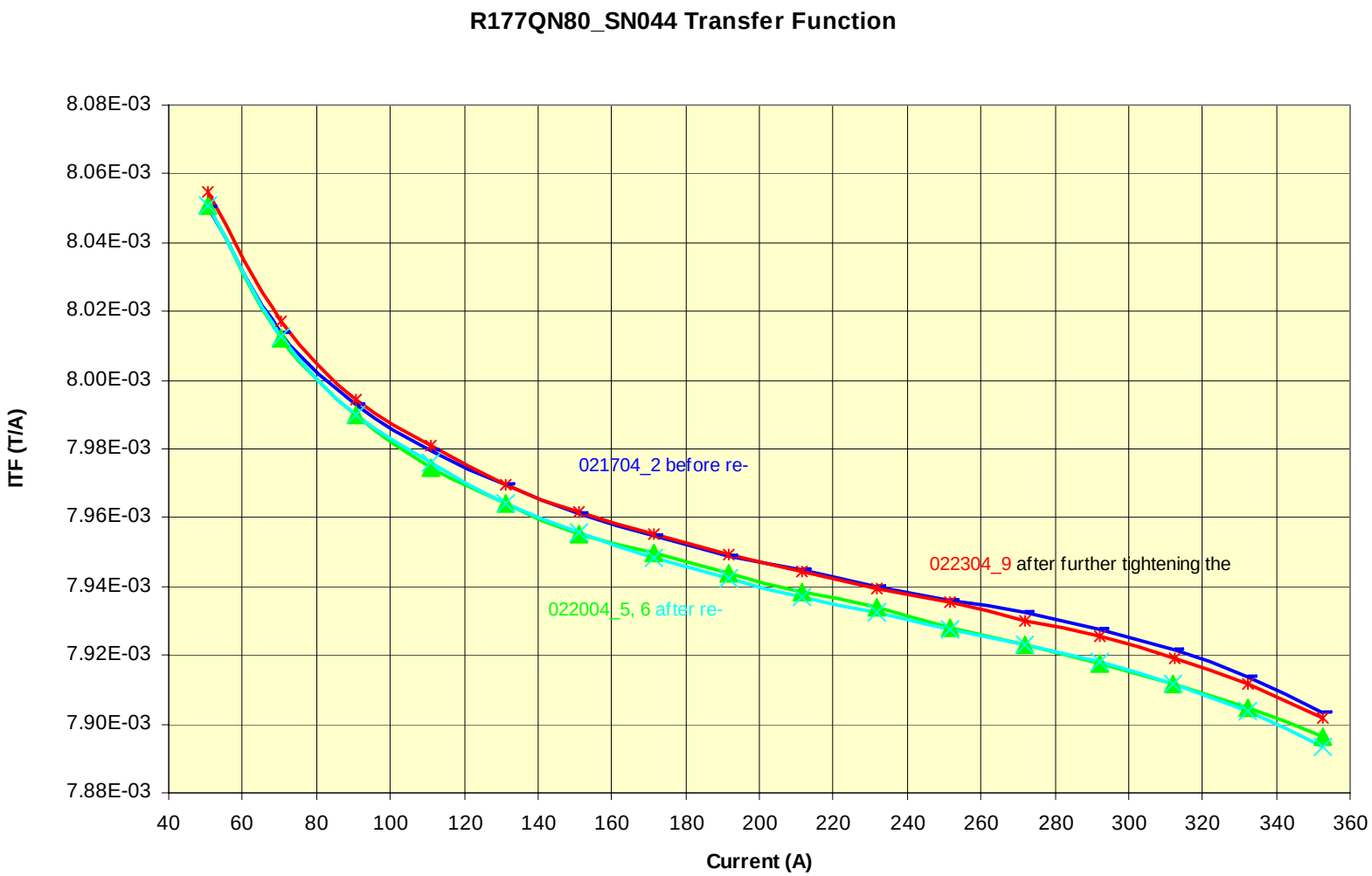


Typical CCL Quad Harmonics

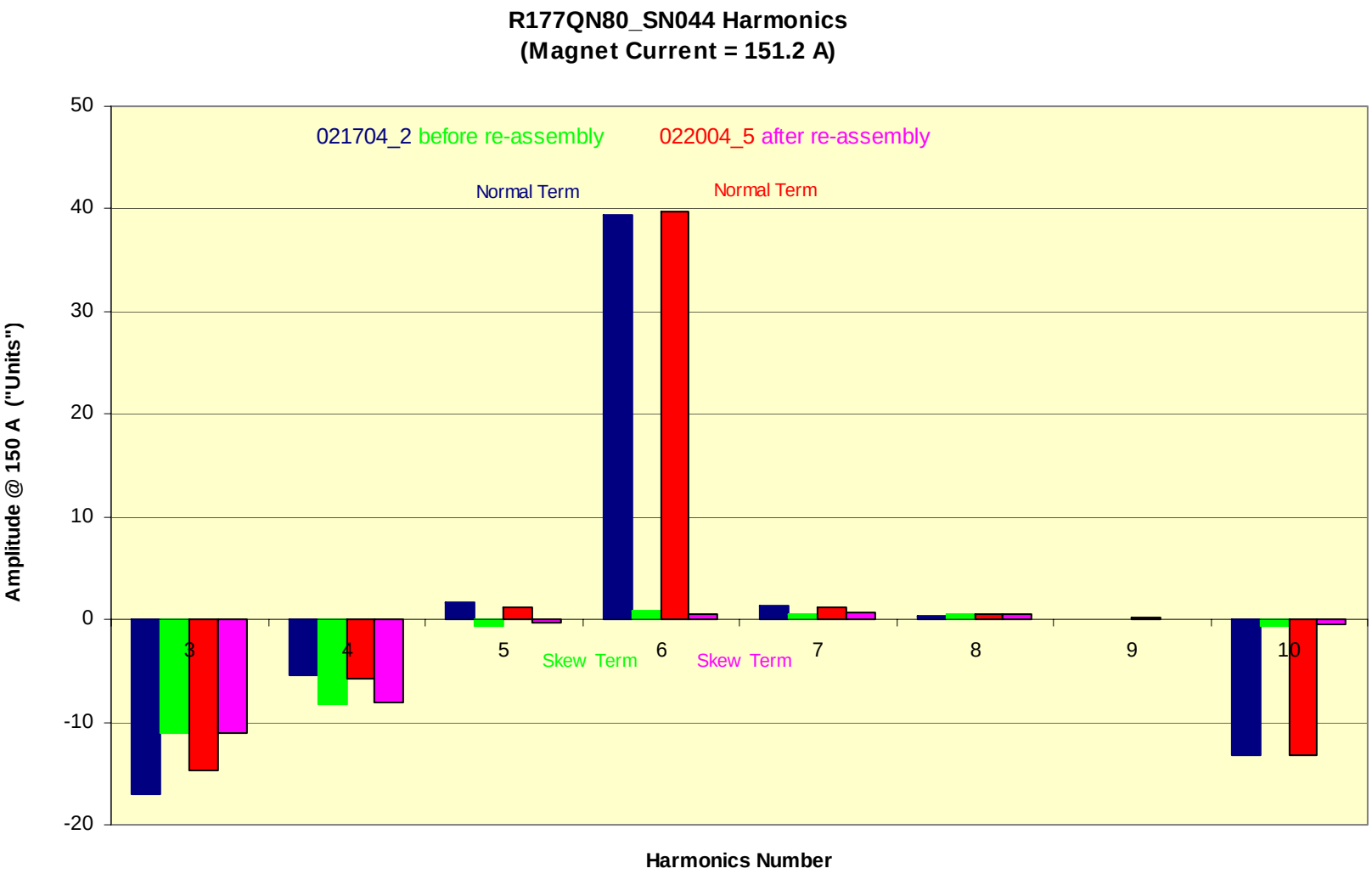




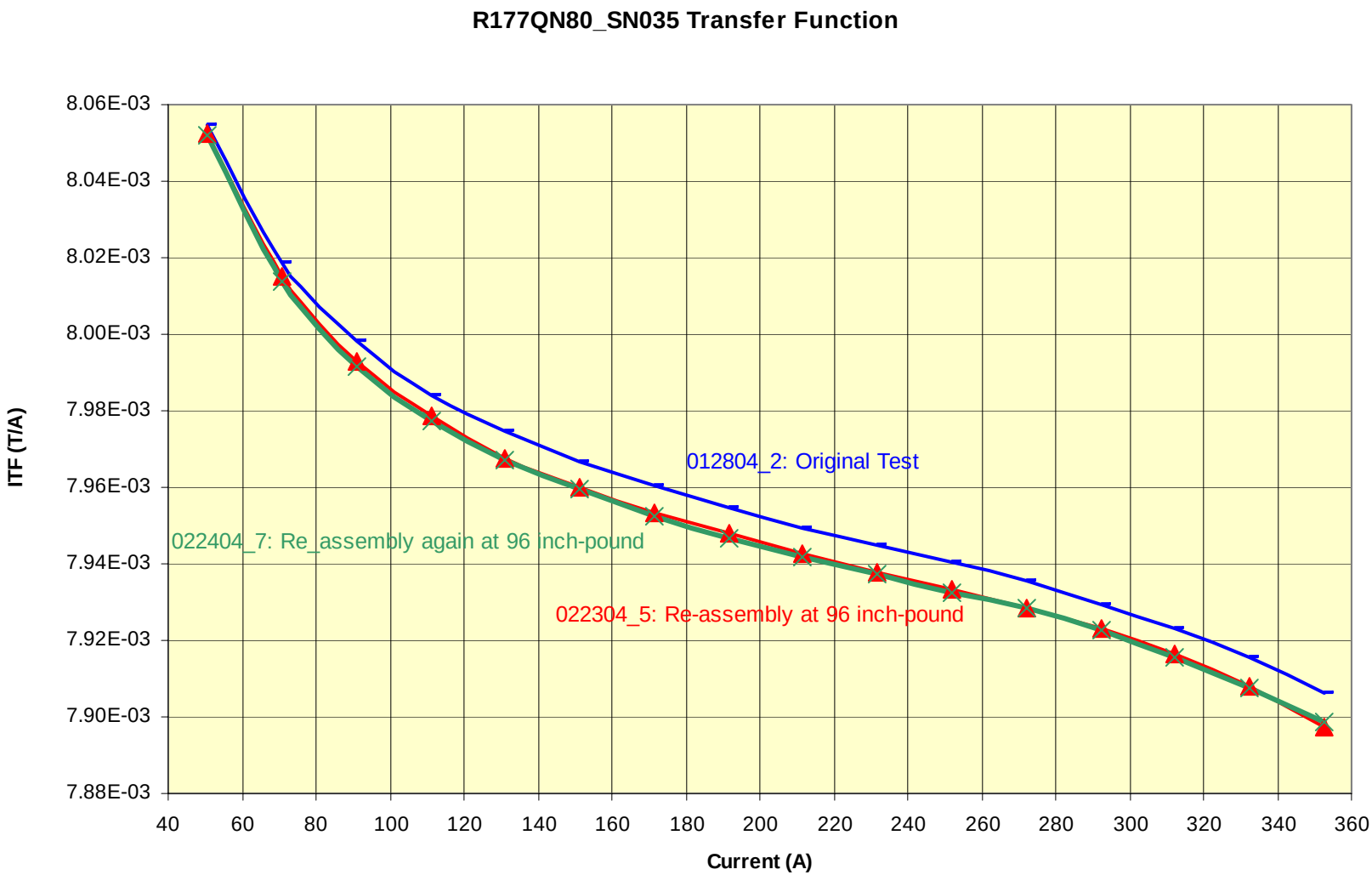
CCL Quad Re-assembly Test 1



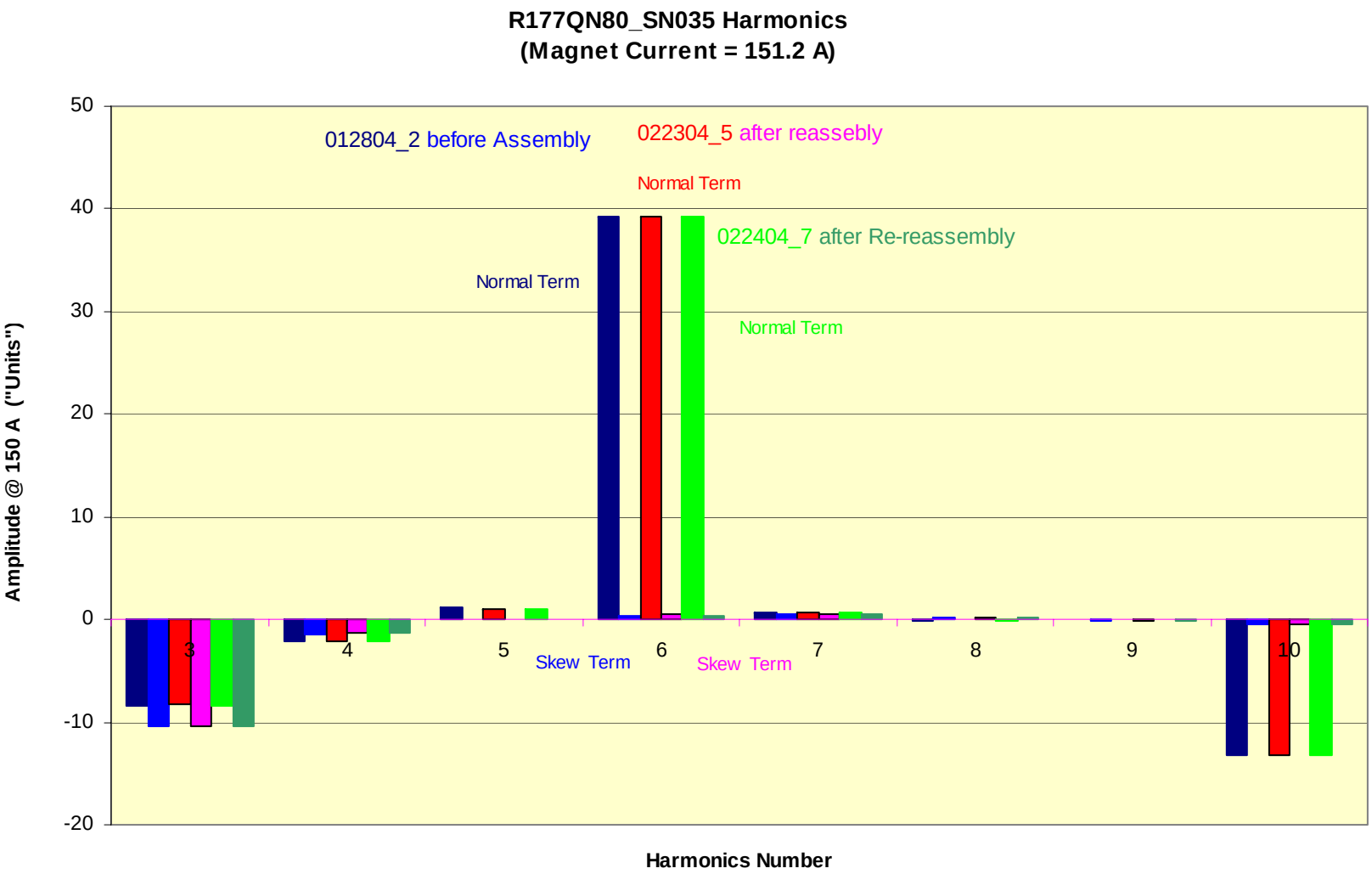
CCL Quad Re-assembly Test 1



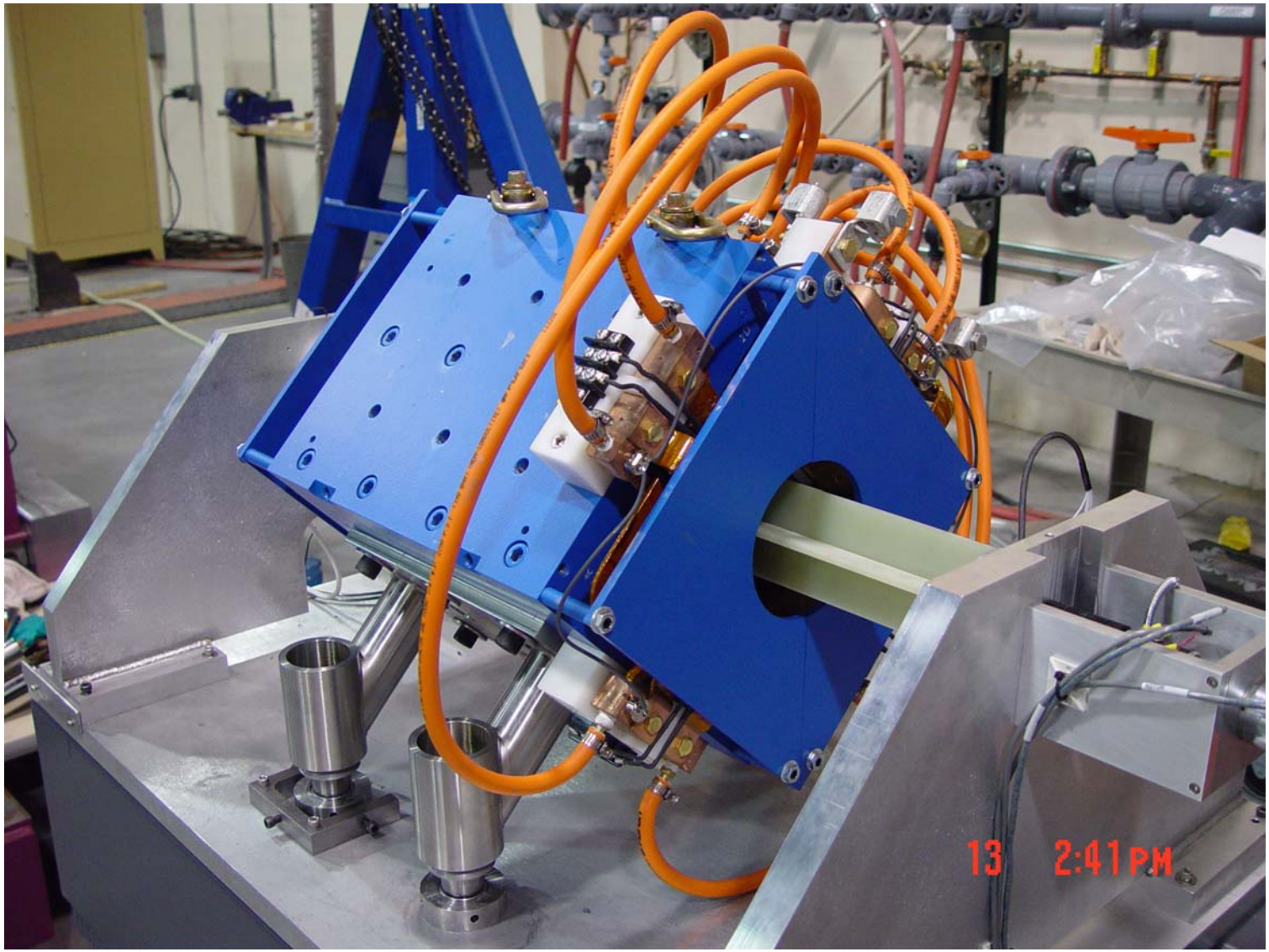
CCL Quad Re-assembly Test 2



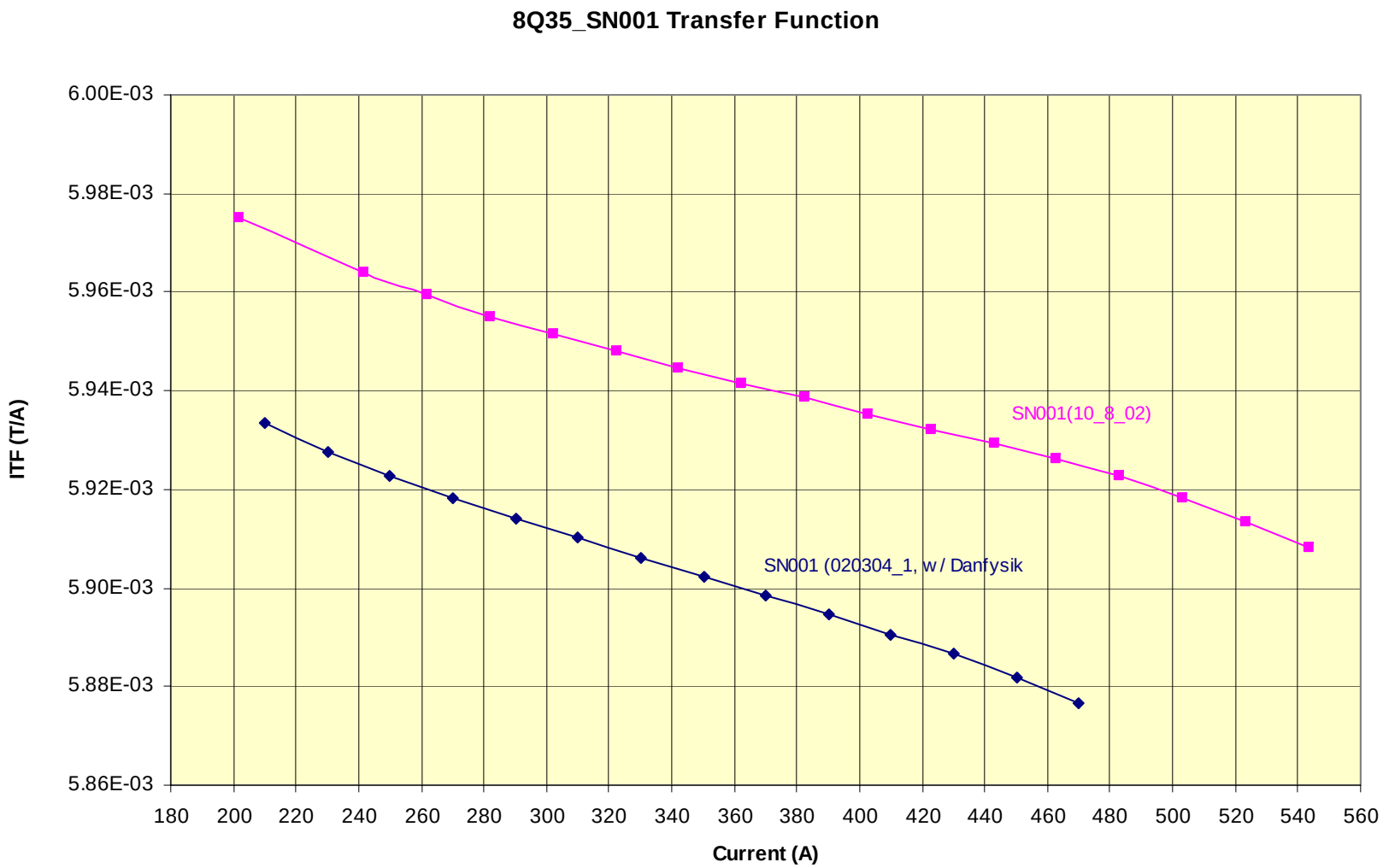
CCL Quad Re-assembly Test 2



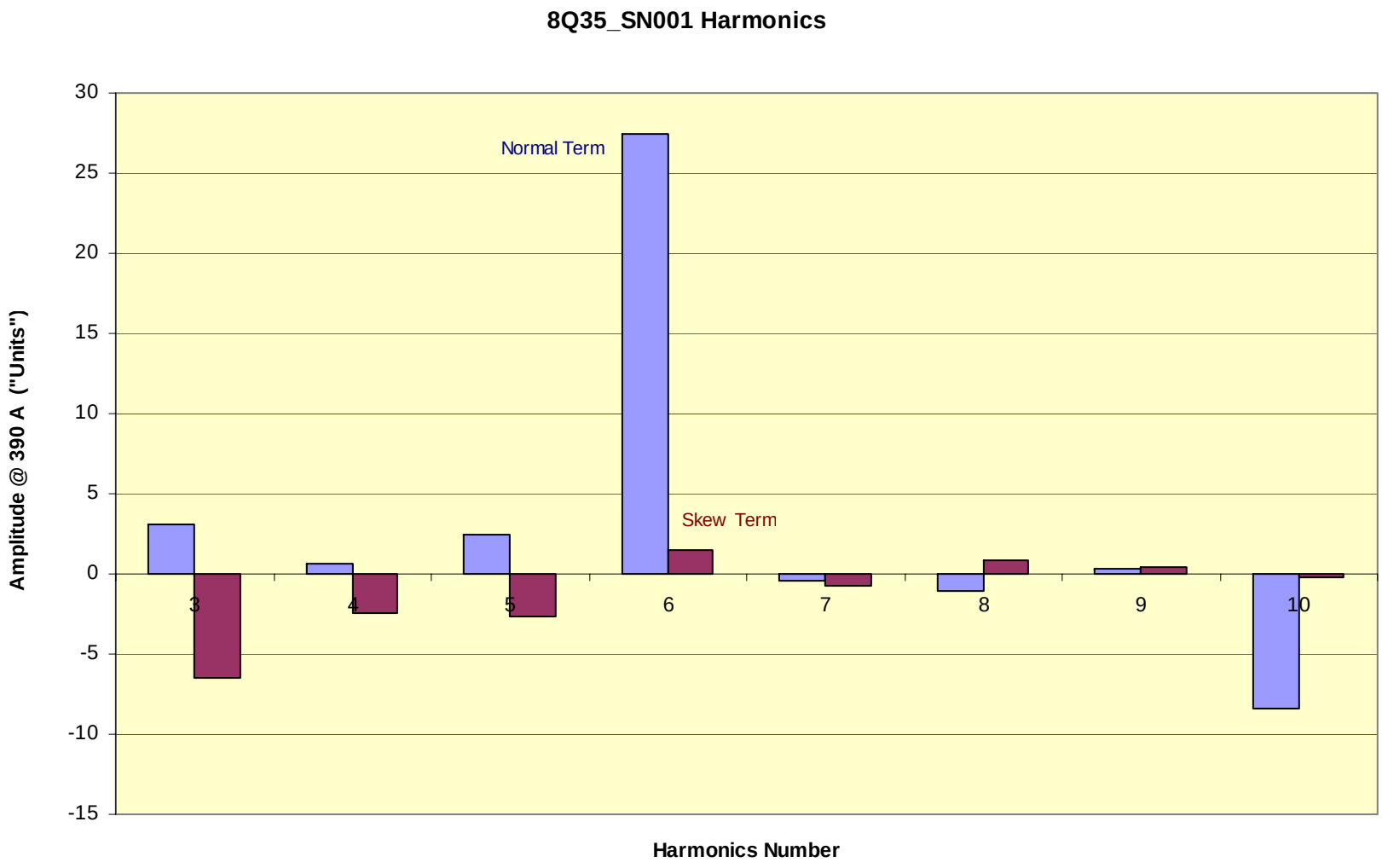
SCL Quad (8Q35) Measurement



8Q35 SN001 ITF



8Q35 SN001 Harmonics



Summary

- We have almost finished all the DTL magnets:

  DTL EMD: 24 (completed) / 24 (needed)

  DTL PMQ: 139/140 (only DTL6_17 missing)

- We have to solve the re-assembly problem and we may have to re-map the CCL Quads: ?

  38 (?)/50

- We have just started SCL Quad Measurements:

  1/64

- We also have other activities, such as measurement of transfer line magnets: 21Q40, 27CD30, etc, which will be reported later.