Testing First 130 L2 Production Sensors

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- IV and CV tests of 130 sensors finished
  except for L2-253CV, 262CV 298CV & IV (due to mechanical measurements)
- IV Summary results (2 sensors behave abnormally L2-227 and 279)
- Compare FNAL FDV and IV to HPK
- Discussion
- Long Term Stability Test Results (on Prototype Sensors)

•Aug.21 2003

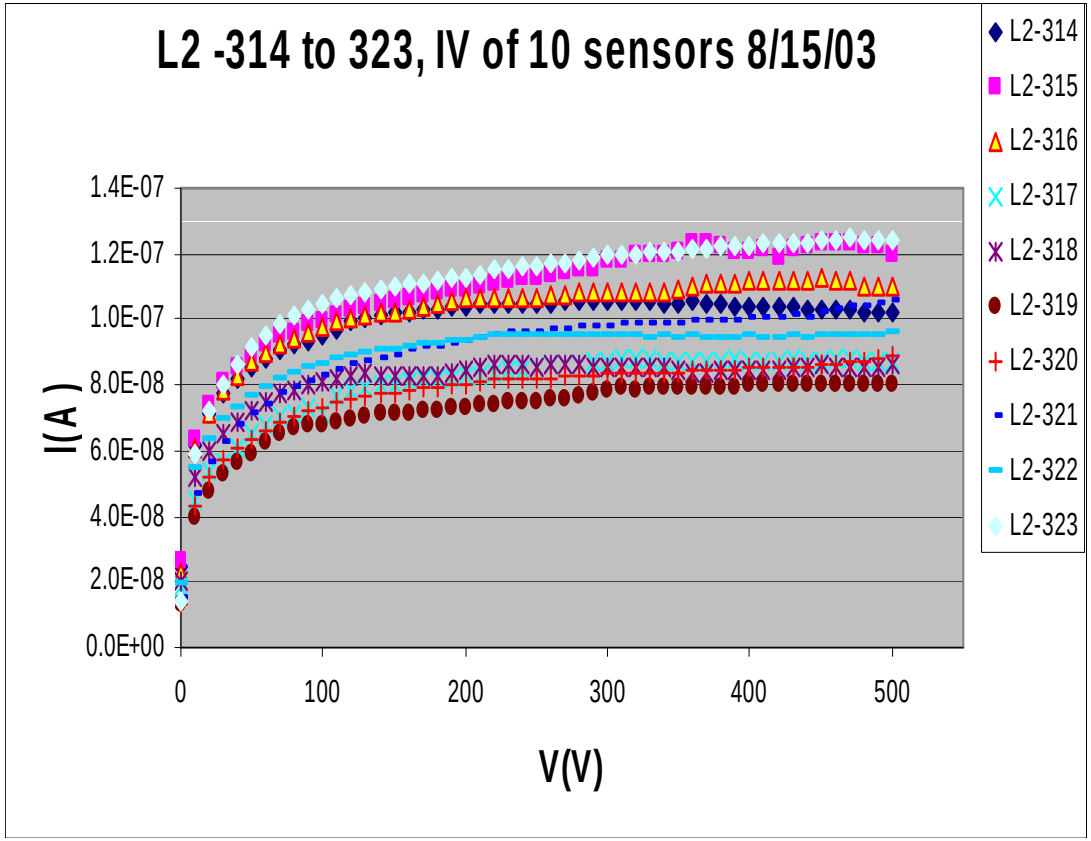
All Data at

http://d0server1.fnal.gov/users/lipton/www/asptest/sensor_test.html

or

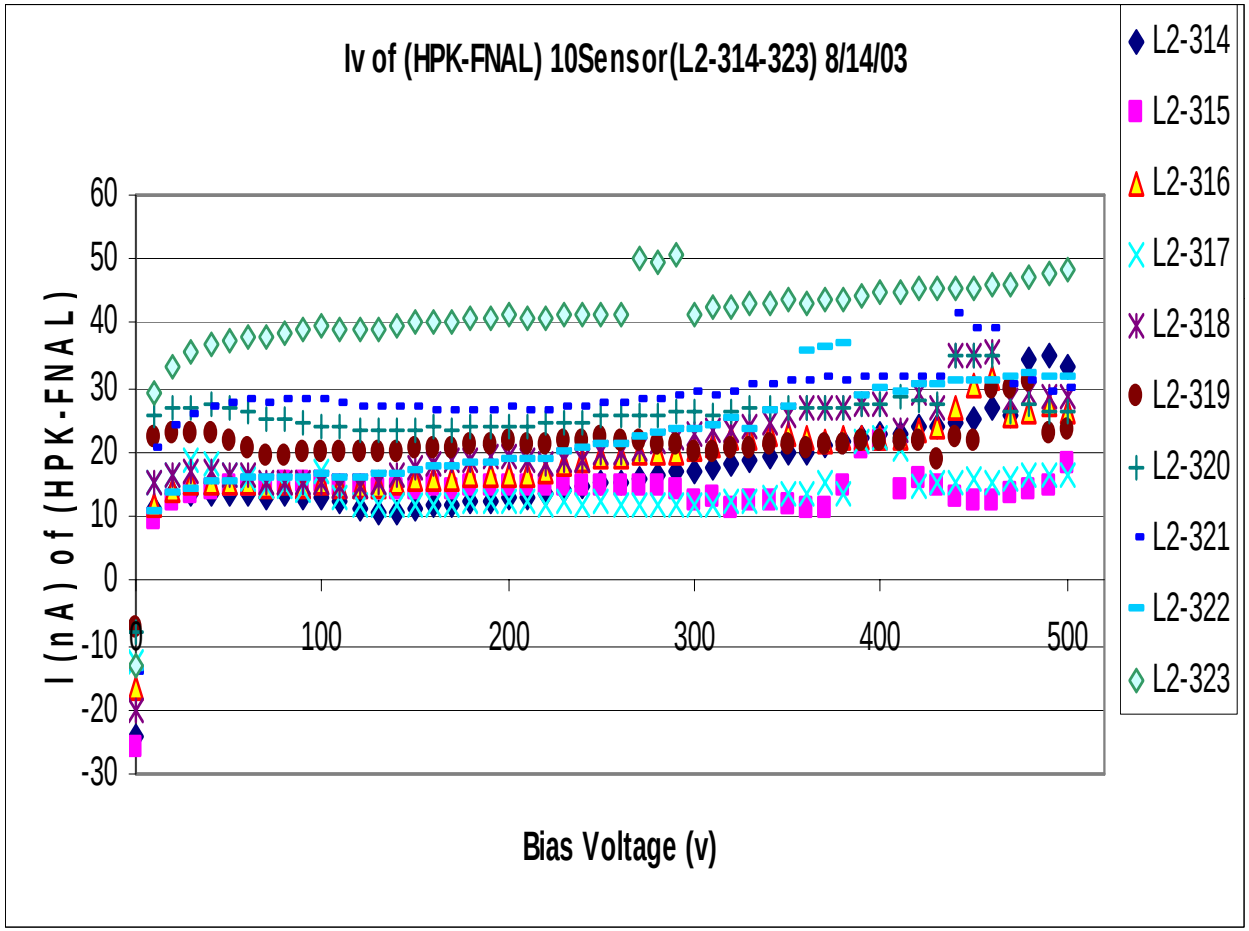
\\d0server6\projects\Silicon\Probing\FNAL2b\L2-Jul3103

IV Curves for 10 sensors



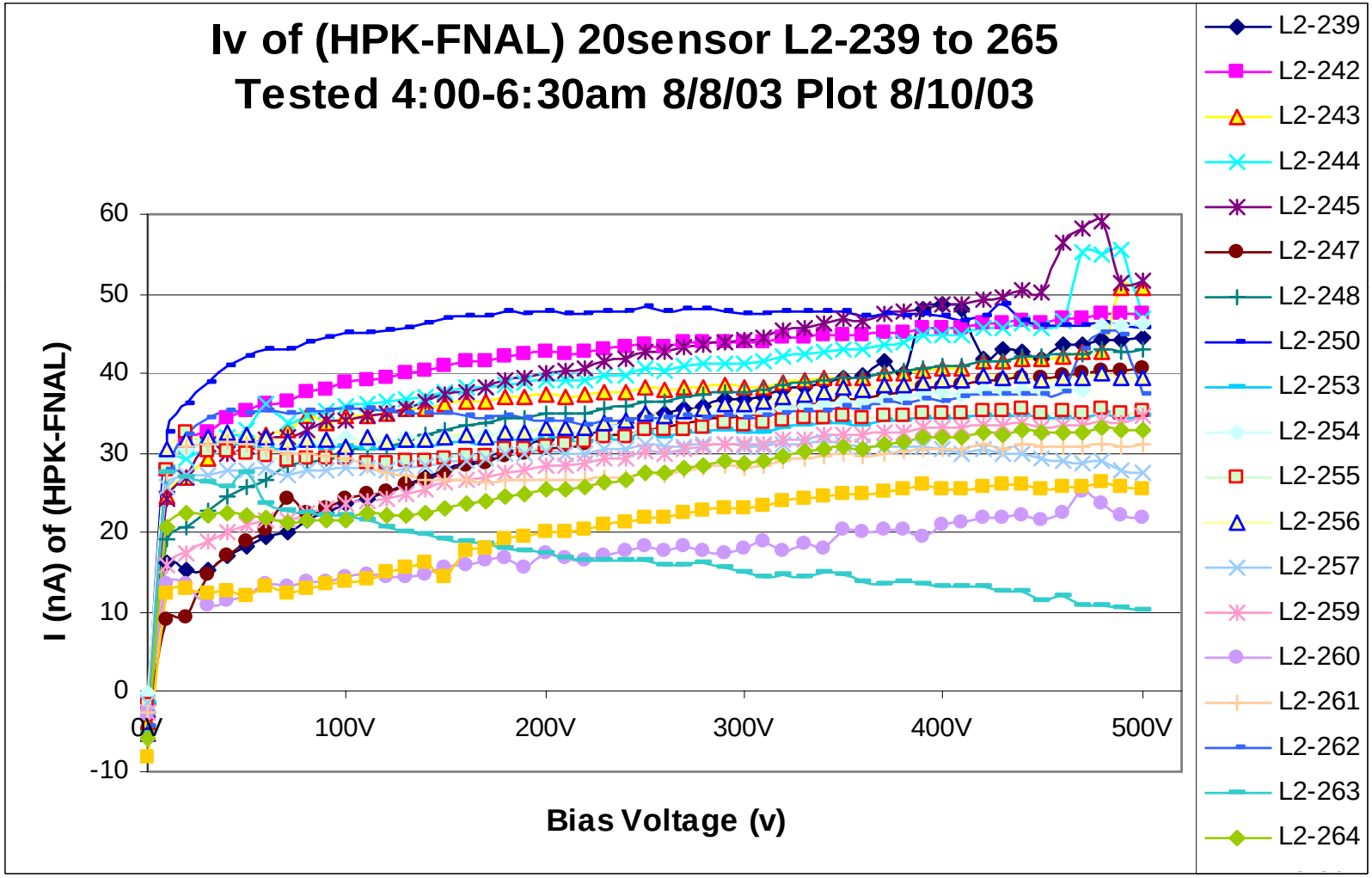
- Here are the last 10 sensors' IV curves. Tested with good light cover.

Compare HPK and FNAL IV Data



- Last 10 sensors compare to HPK
- Current measured by HPK mostly larger than at FNAL

20 Other IV Comparisons (Early Morning)

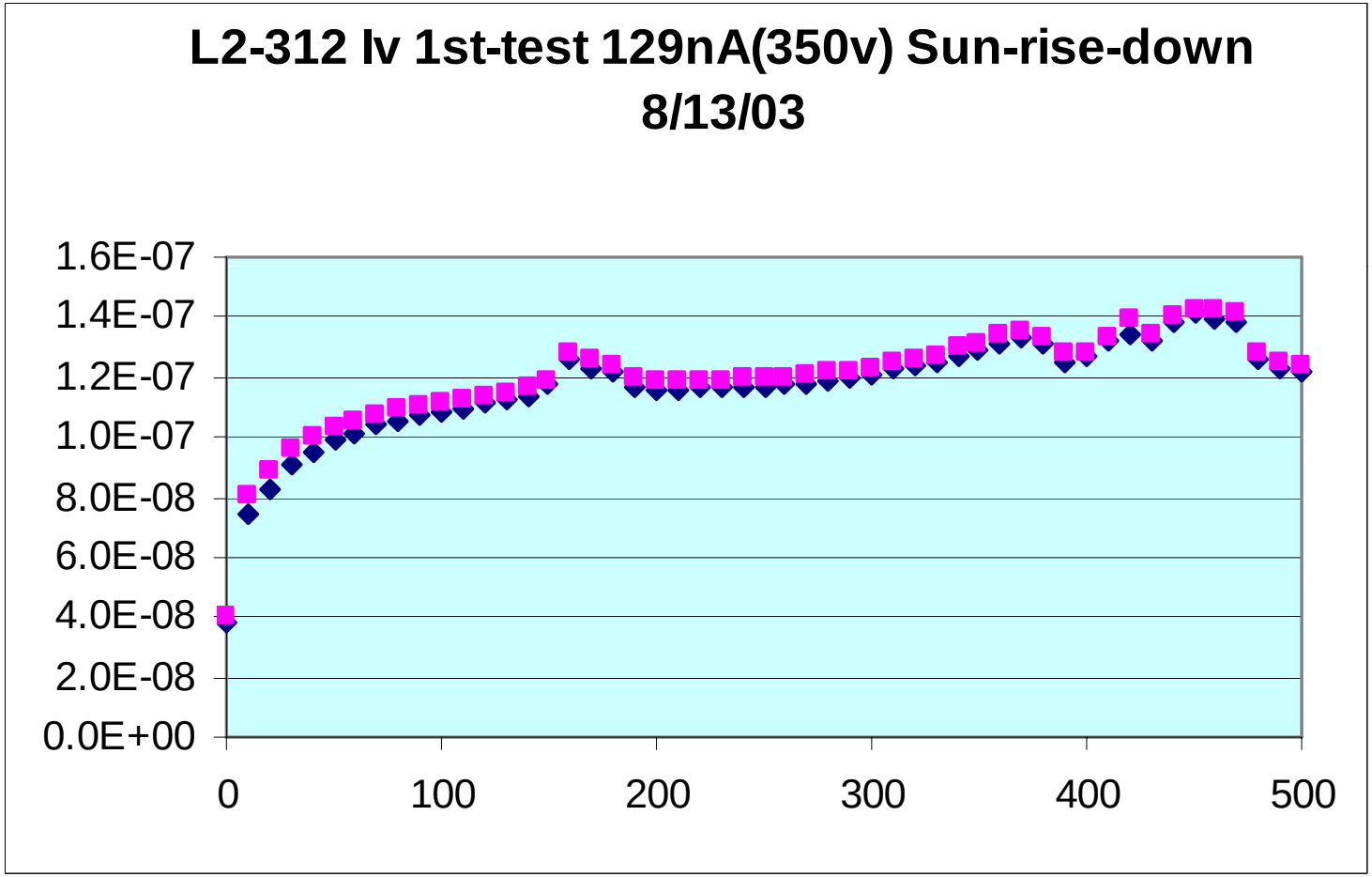


Discussion of IV Scan Results

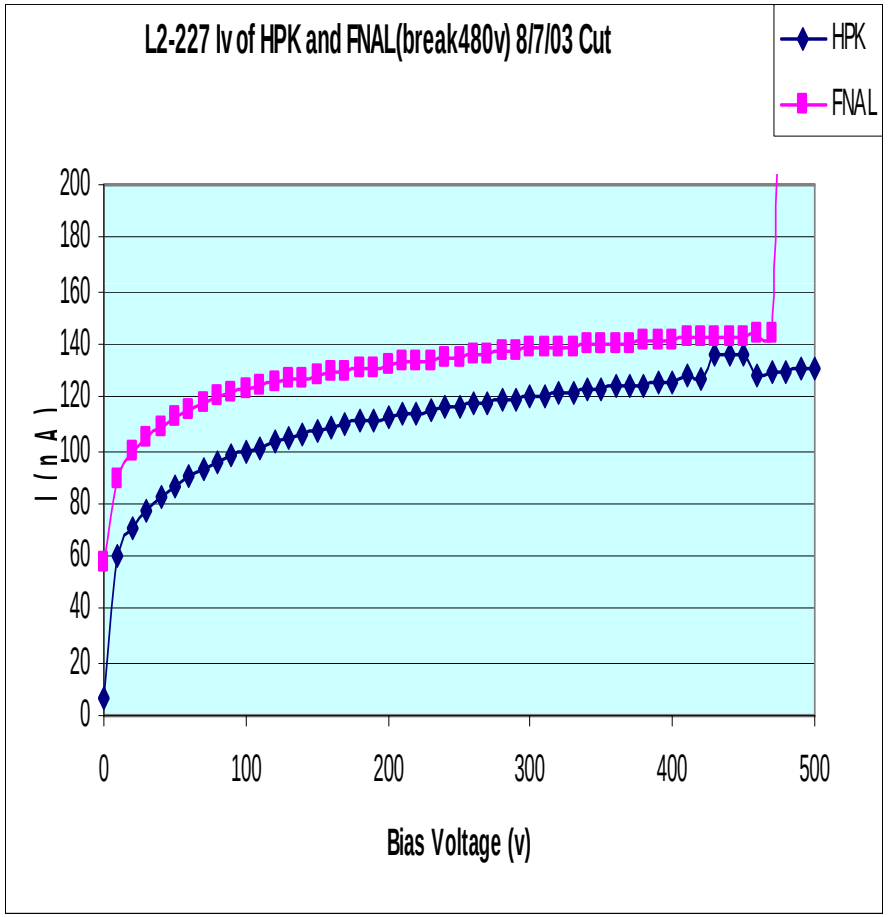
- FNAL currents mostly smaller than HPK values.

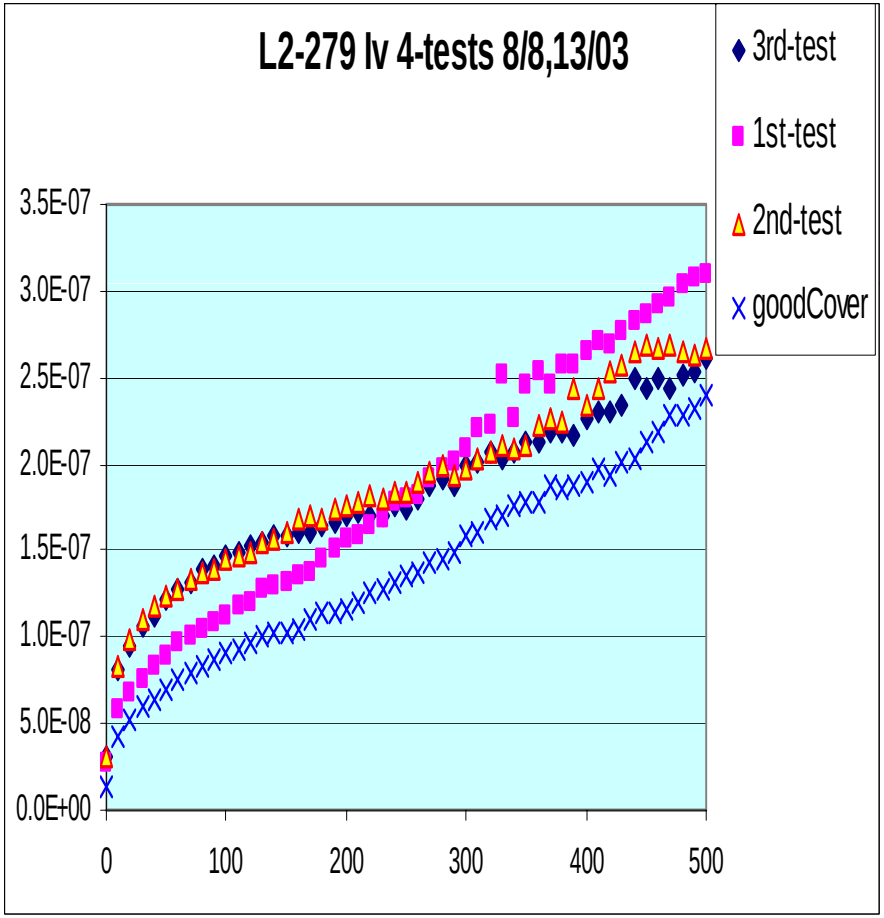
- Our test station can get sunshine during the day. We found IV curves are sensitive to changes in external lighting conditions due to sunshine and clouds, although the black cover was used.
- So, eliminating light leakage is very important. That is why tests were performed in the early morning. Or else make a very good light cover.

Sometime Sun Shine, Sometime Cloudy

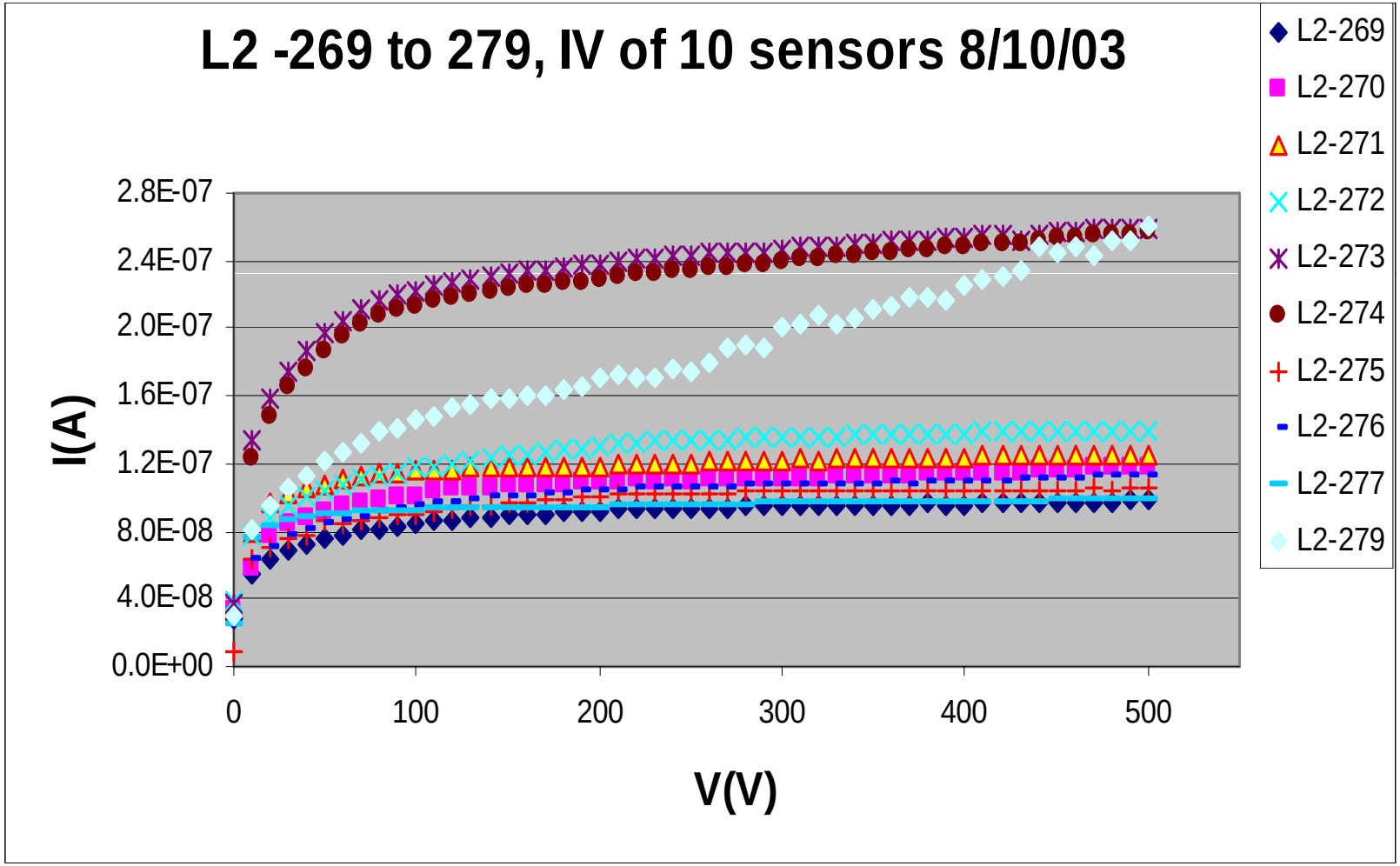


2 Sensors (227 and 279) Misbehave

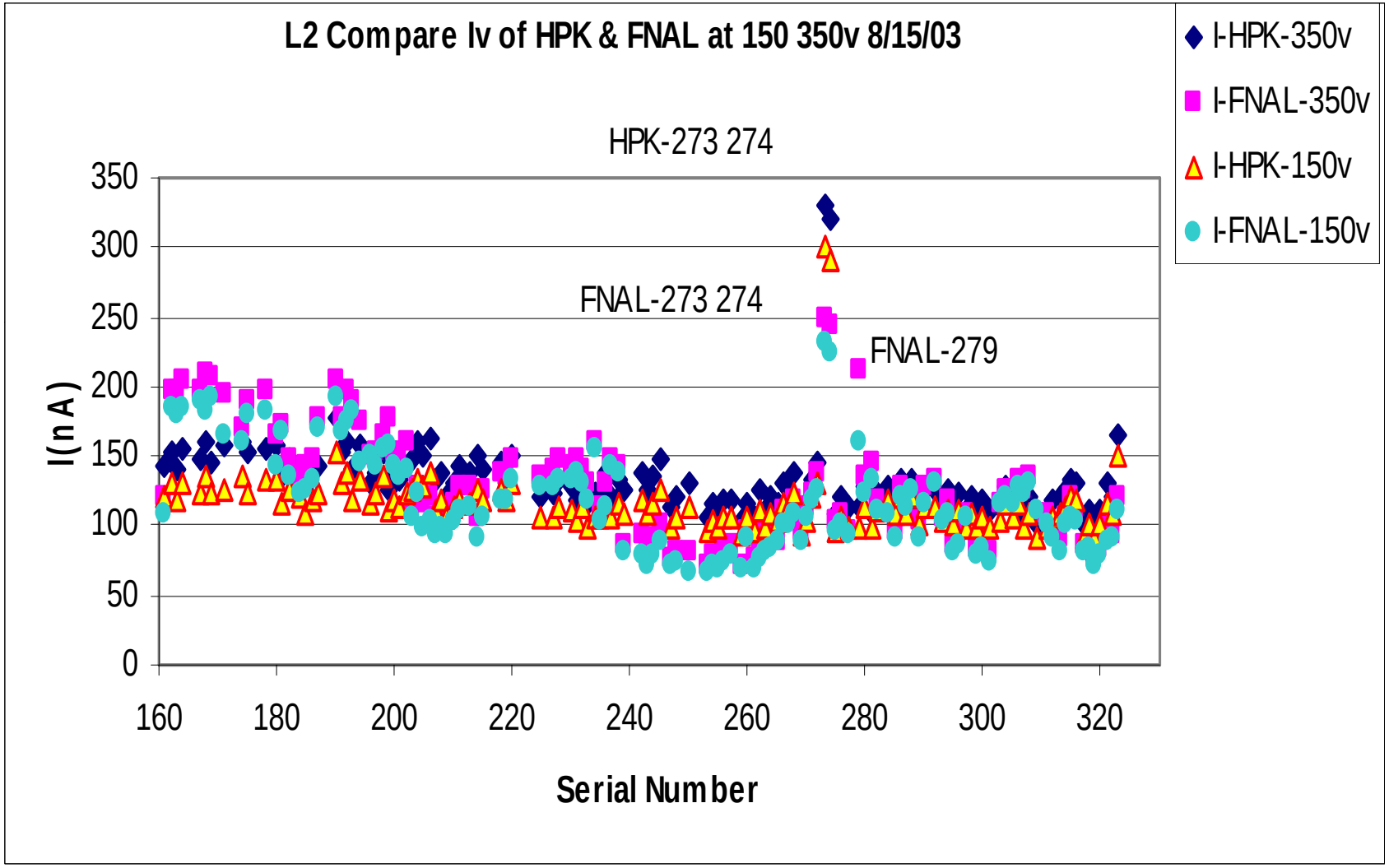




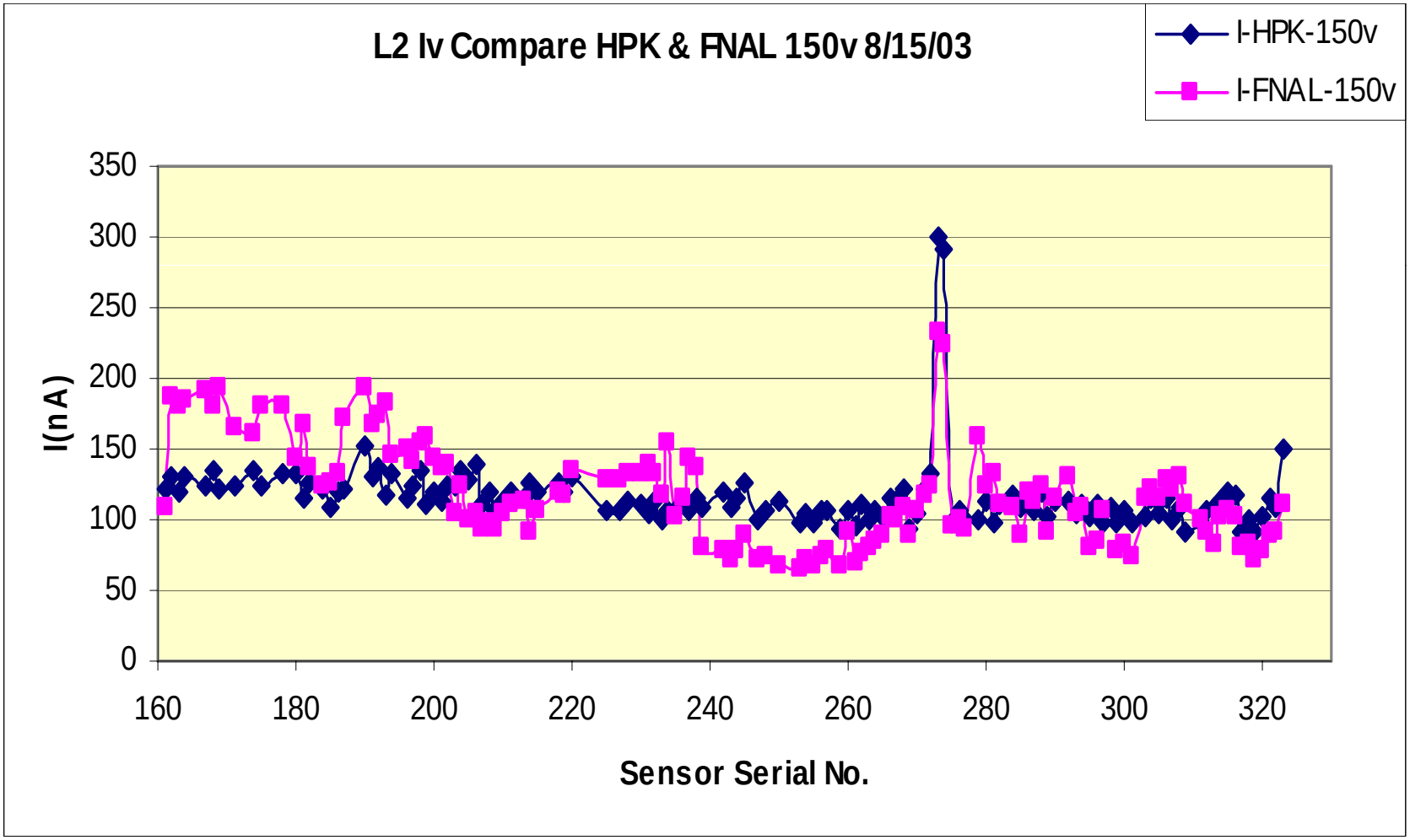
L2-279 bad


L2 -269 to 279, IV of 10 sensors 8/10/03
I(A)
2.8E-07
2.4E-07
2.0E-07
1.6E-07
1.2E-07
8.0E-08
4.0E-08
0.0E+00
0
100
200
300
400
500
V(V)
L2-269
L2-270
L2-271
L2-272
L2-273
L2-274
L2-275
L2-276
L2-277
L2-279

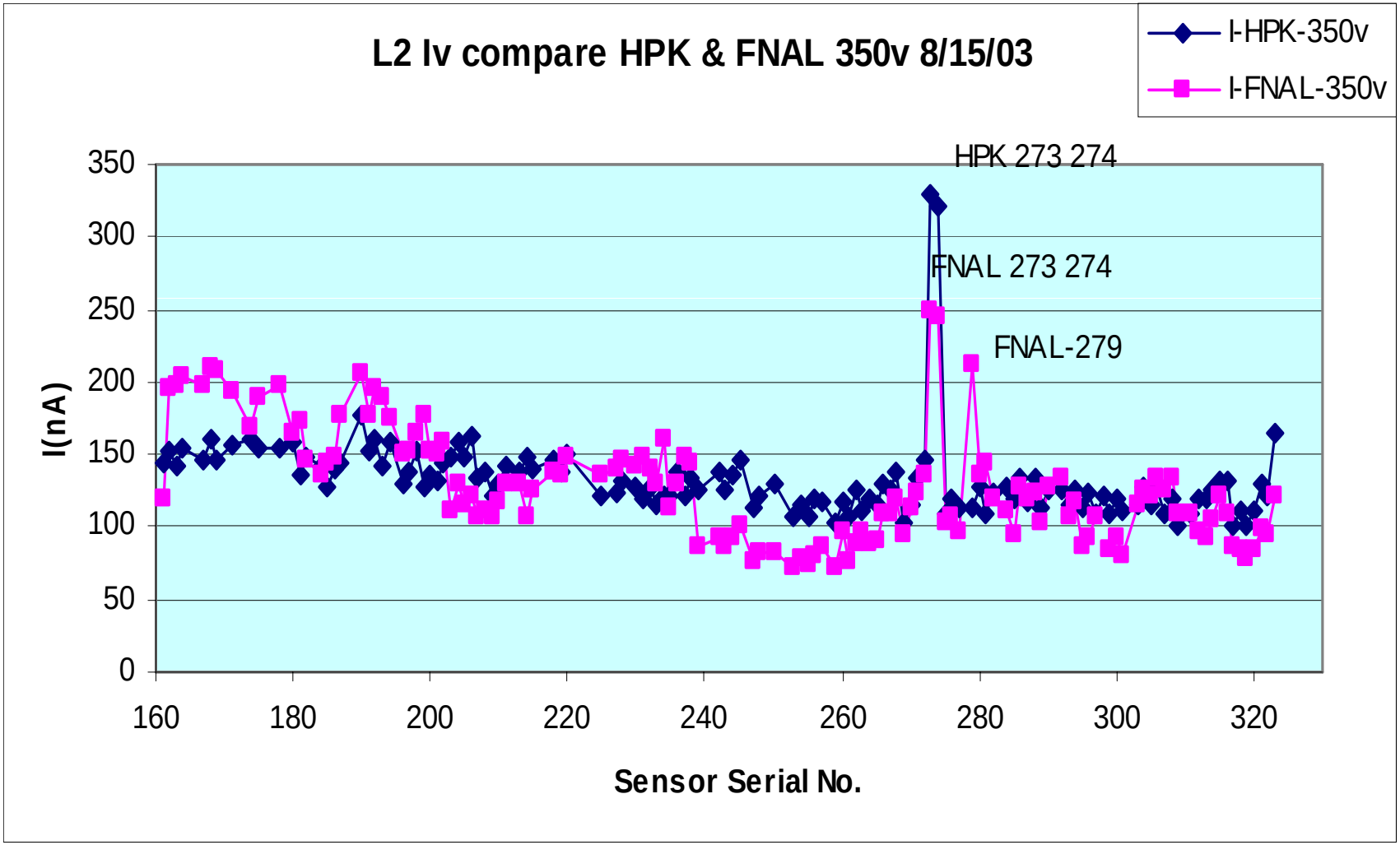
HPK and FNAL Currents at 150 and 350v



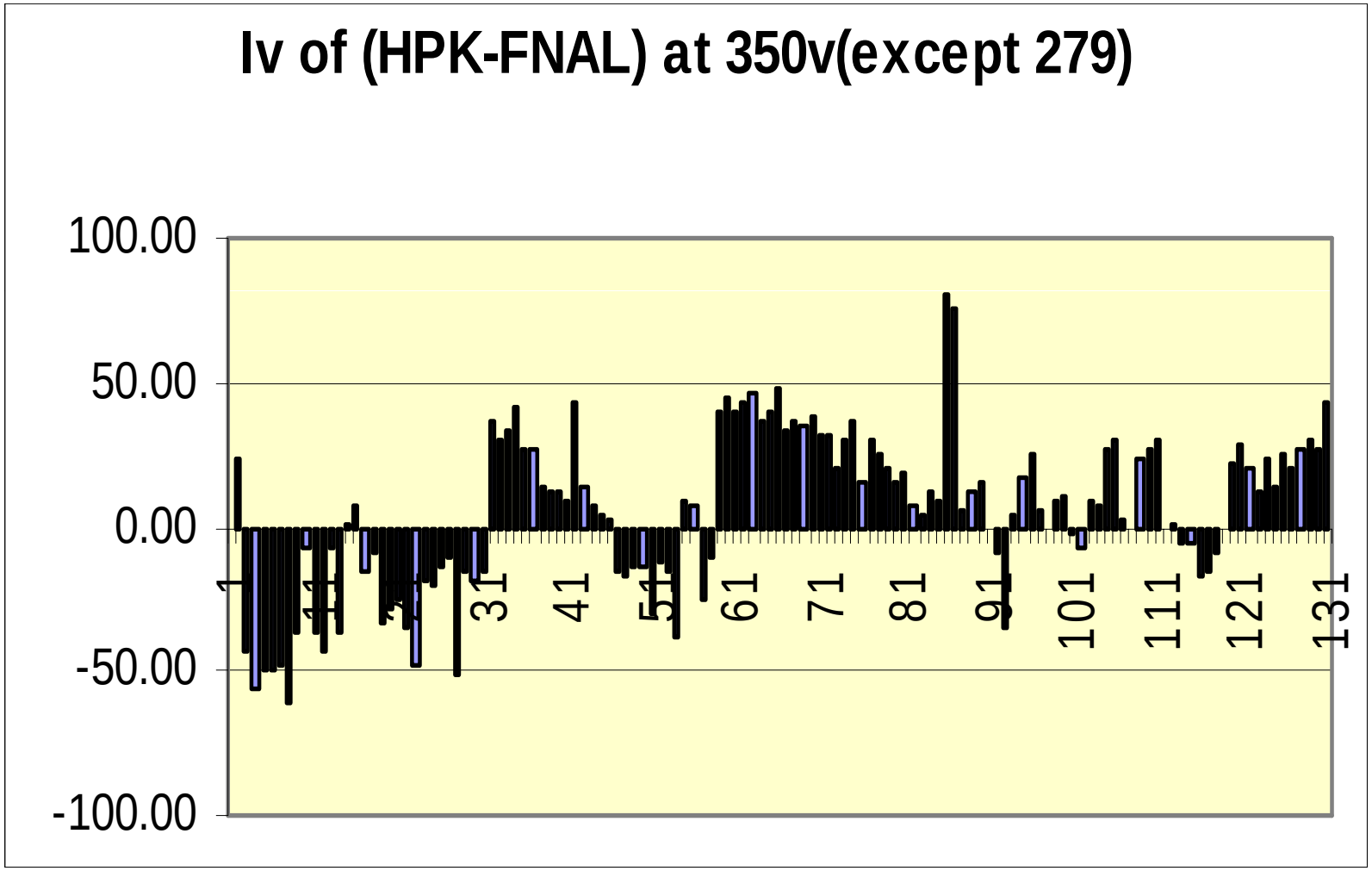
HPK and FNAL Currents at 150v



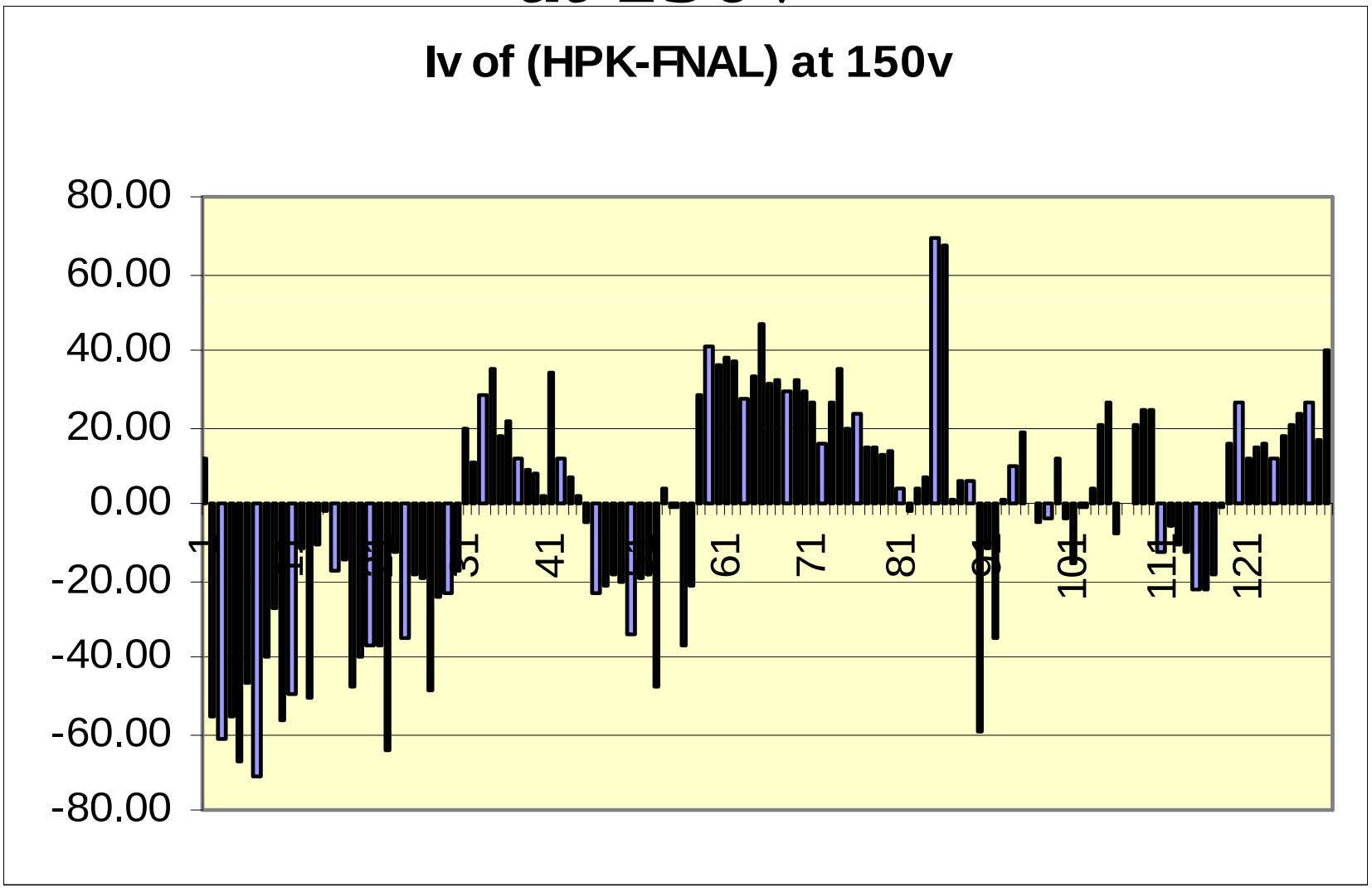
HPK and FNAL Currents at 350v



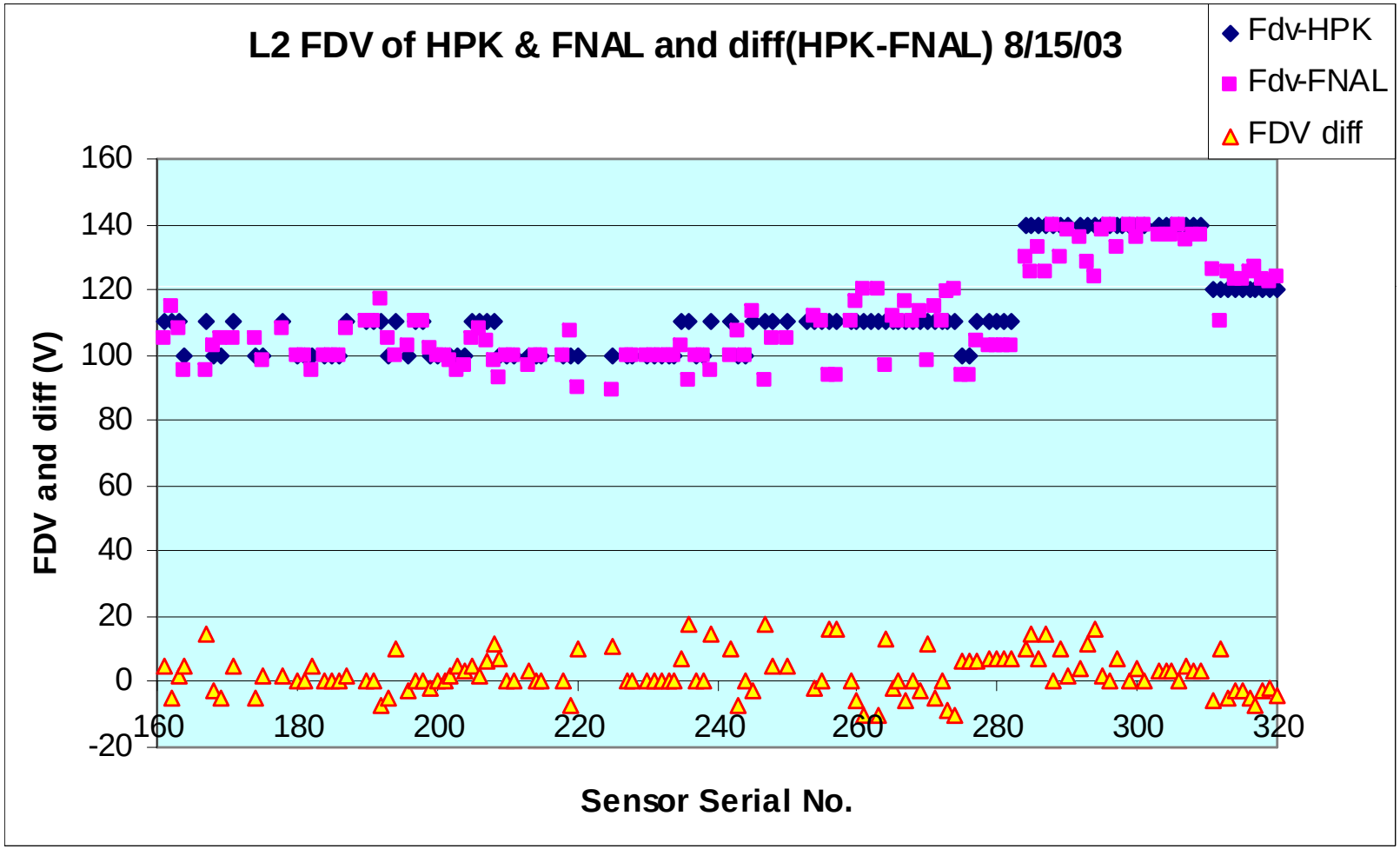
Current Difference (HPK-FNAL) at 350v



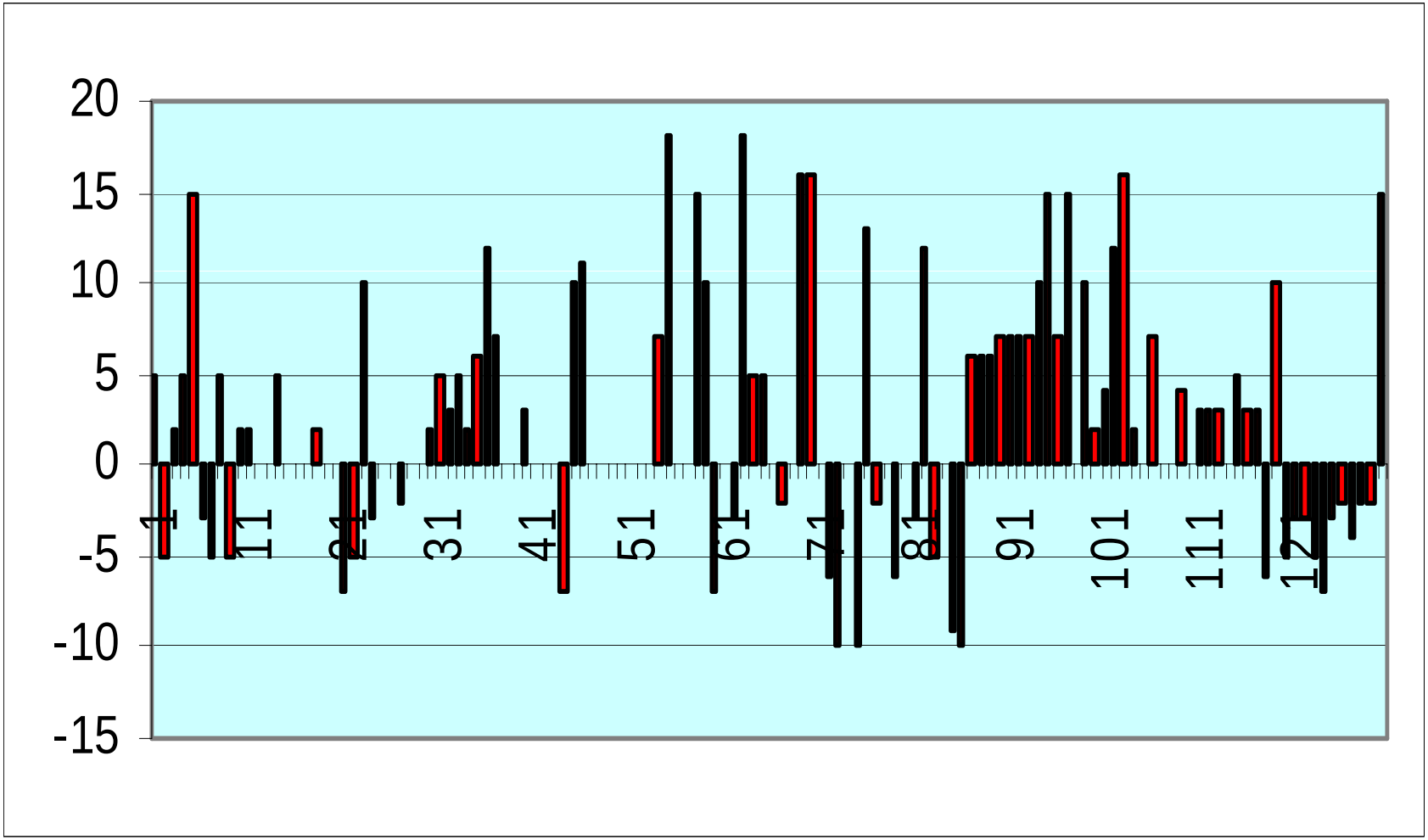
Current Difference (HPK-FNAL) at 150v



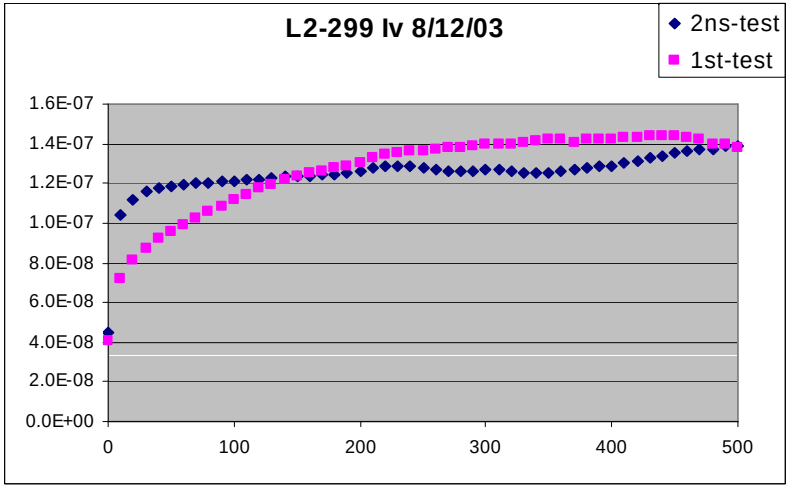
FDV Measured at HPK and FNAL



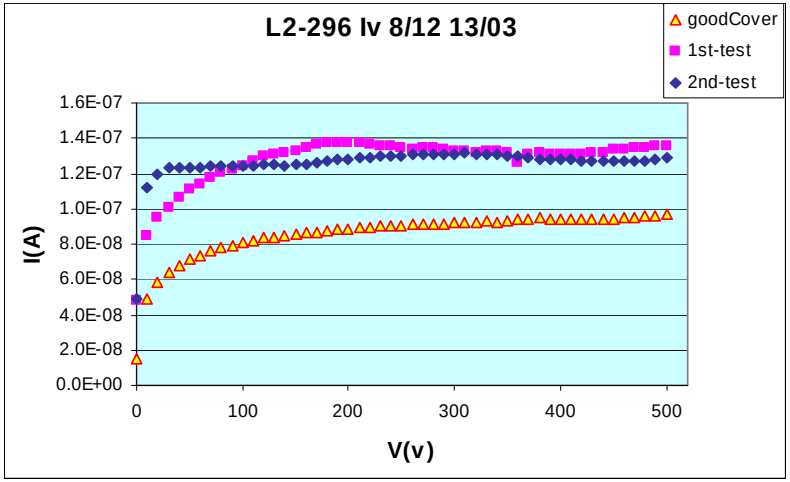
FDV Difference (HPK-FNAL)

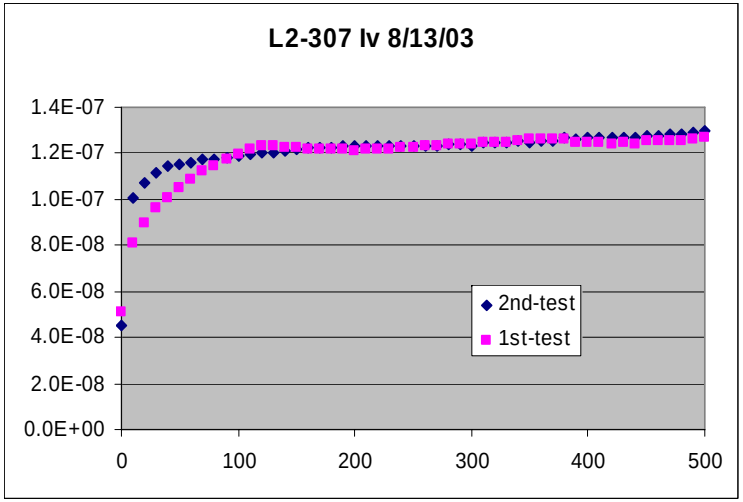


Discussion

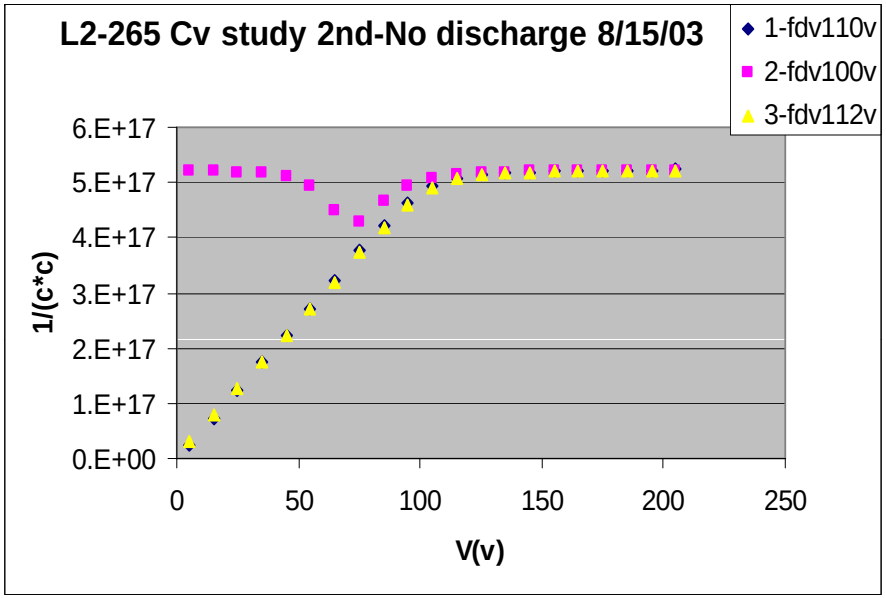


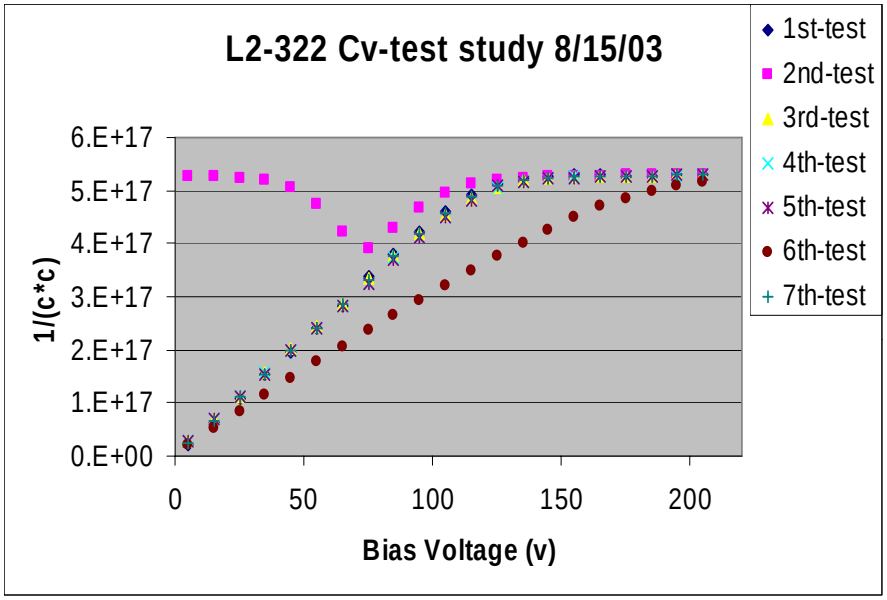
Second IV test is much different than first test at low voltage





CV test: discharge important



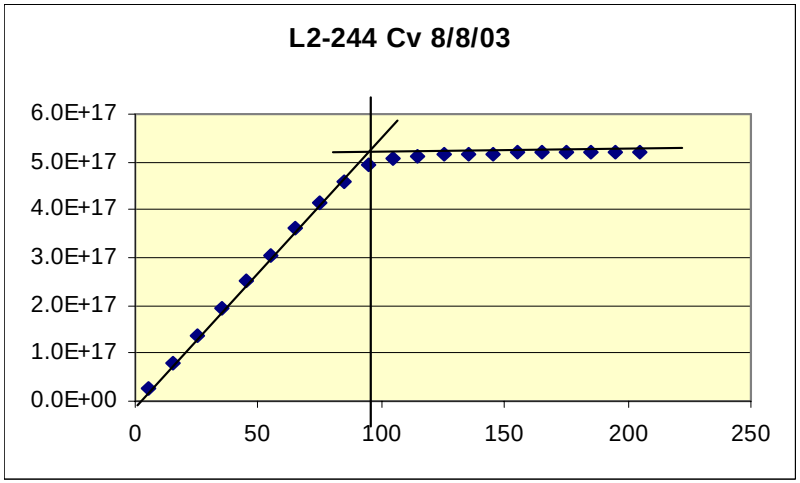


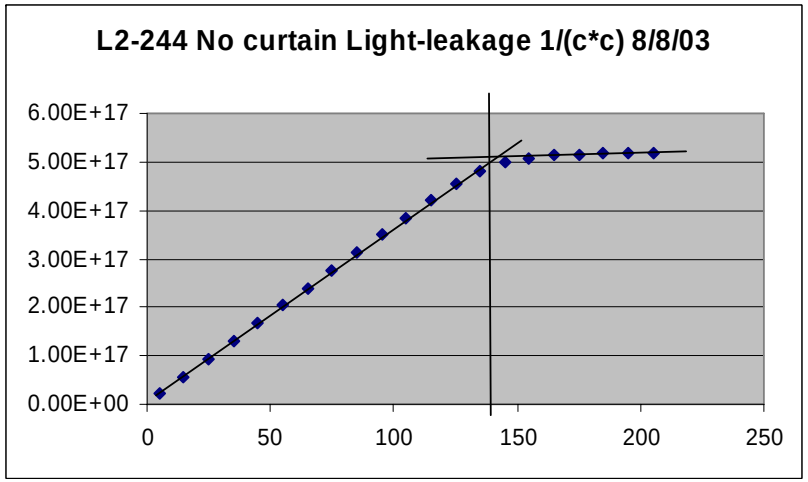
2nd test is not discharged. FDV will be smaller.

6th test -- cover open FDV very large (light leakage).

1 Mohm-in						FDV 2%
1st	Normal					126v
2nd	No-discharge					113v
3rd	discharge					126v
4th	repeat 3rd					127v
5th	discharge	set 5v	before run			122v
6th	discharge	set 5v	before run	outer-cover	open	185v
7th	repeat 5th			cover close		125v

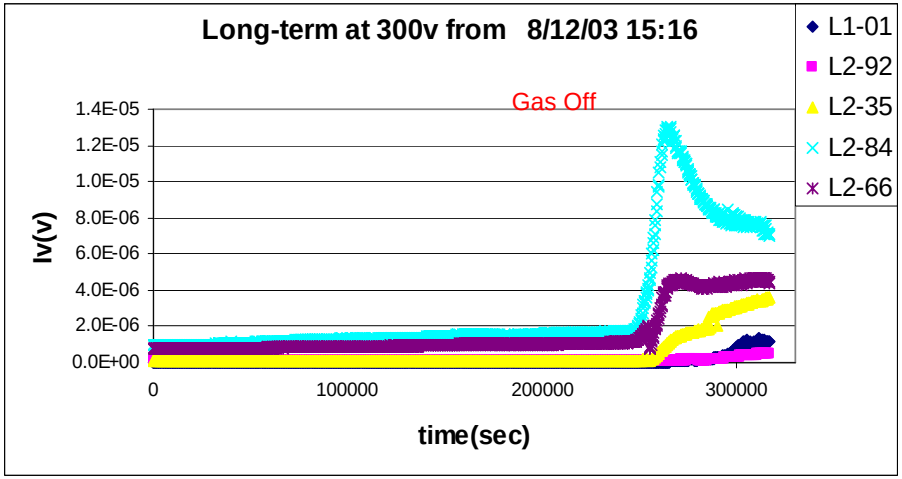
CV test sensitive to light leakage

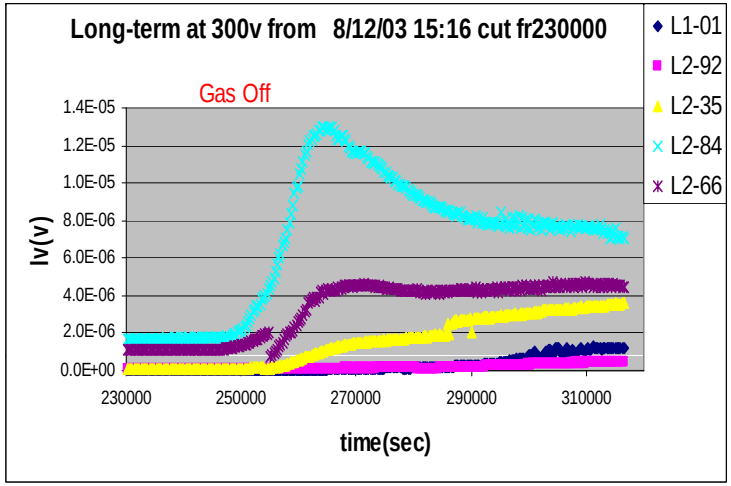


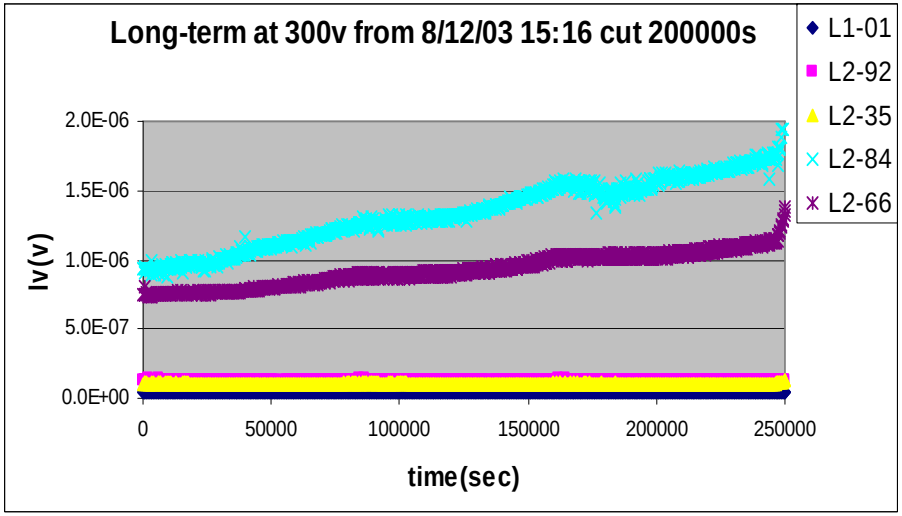


- Bottom plot has open black cover, but still some cover there.
- The FDV in bottom plot is much bigger than top plot due to light leakage.

Long Term Stability Test



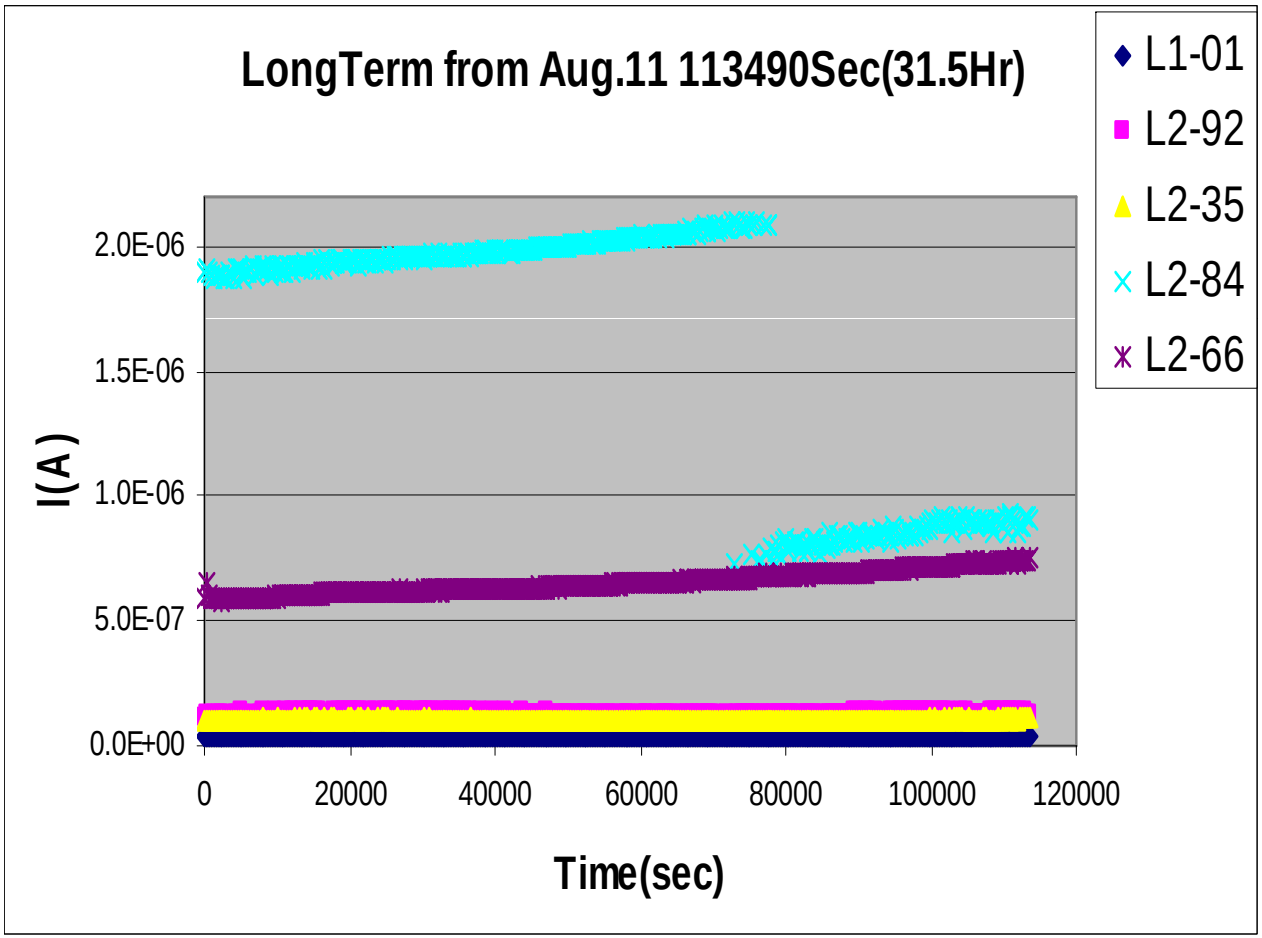




L2-84 and 66 current increasing

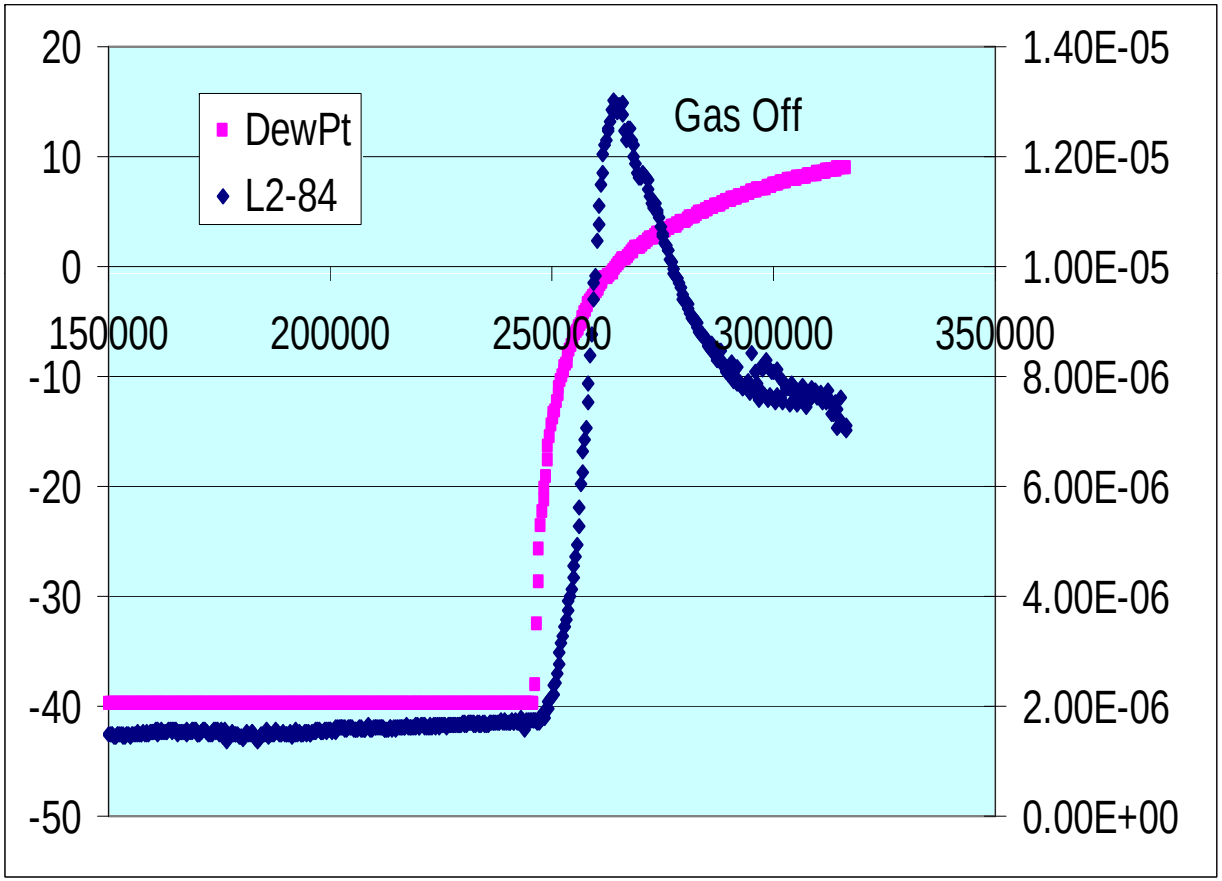
Then after gas off, currents rise dramatically, fall and then increase again

Long-Term Test



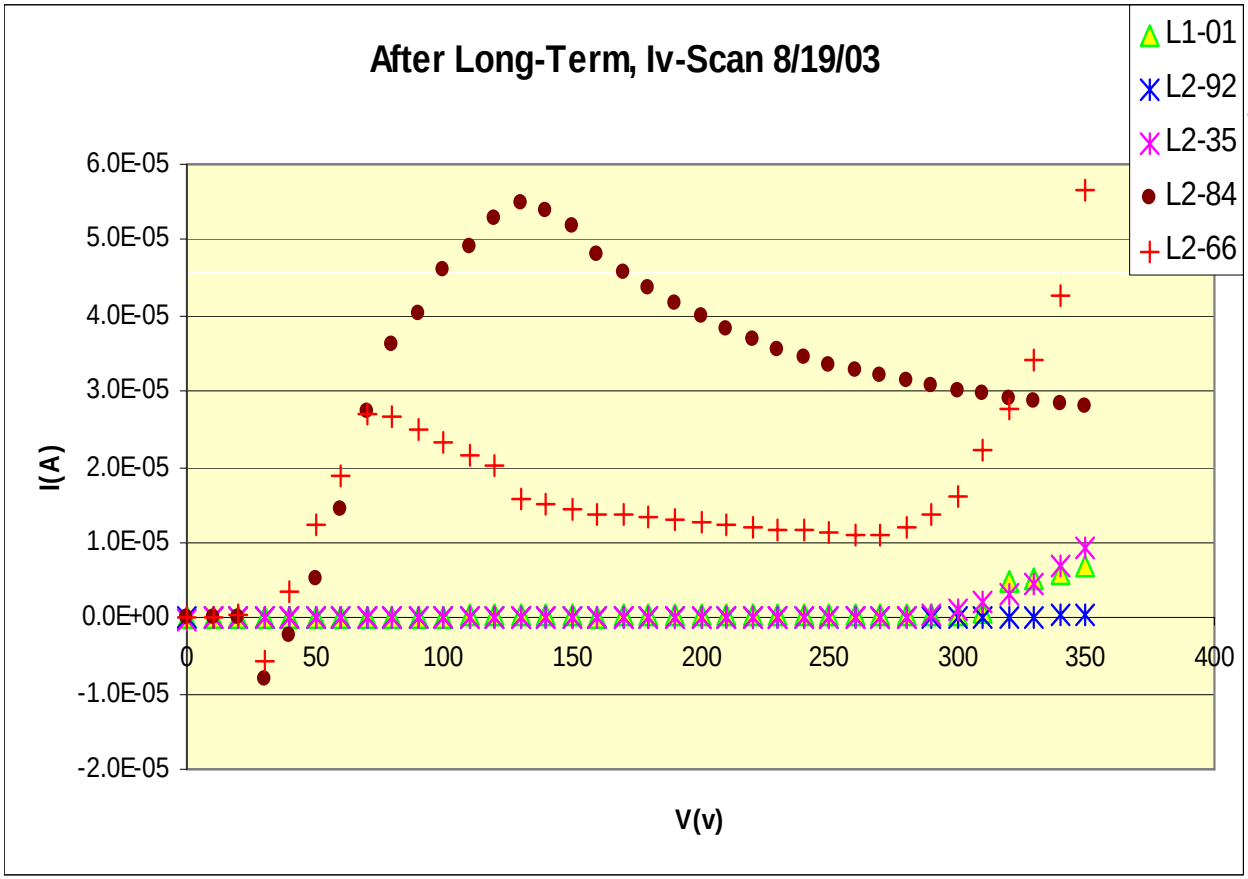
- Current rising for sensor L2-084, and then suddenly drops down (cause unknown) and then resumes upward climb

Long-Term Dew Pt and IV



- Humidity is important

IV Scans after Long Term Stability Test



- Gas Off , at Holder, IV scans for five sensors after completion of long-term stability test