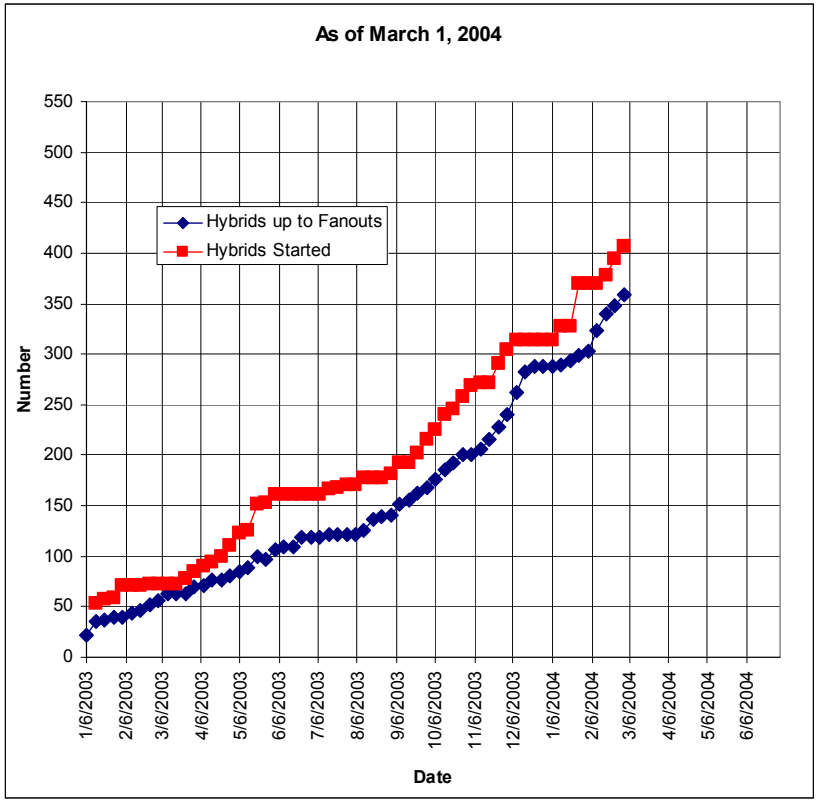
USA SCT Barrel Module Assembly

SCT Week CERN
March 2004

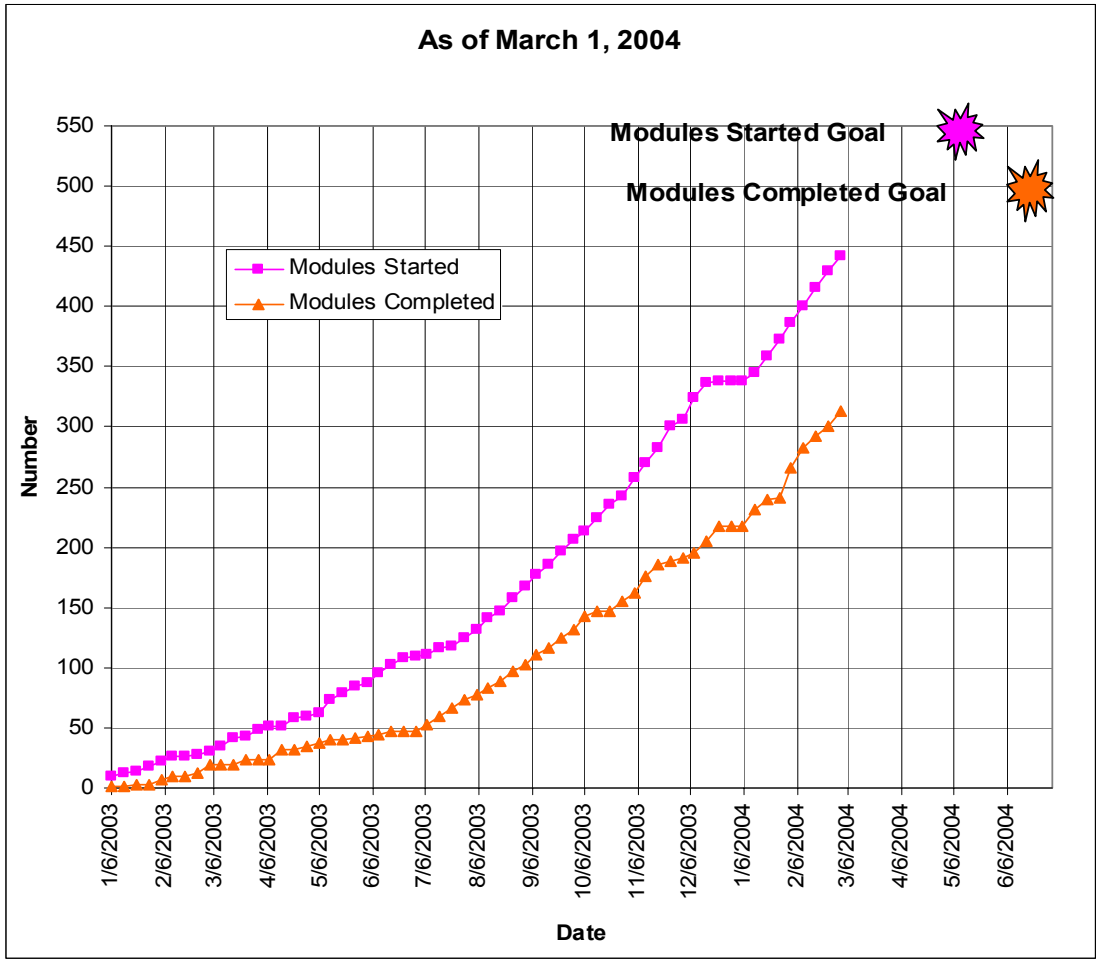
Presented by Abe Seiden
U.C. Santa Cruz

Hybrid Production

- Strongly coupled to deliveries and reworks
- 407 (359) started (completed) total, 116 (131) since last SCT week.



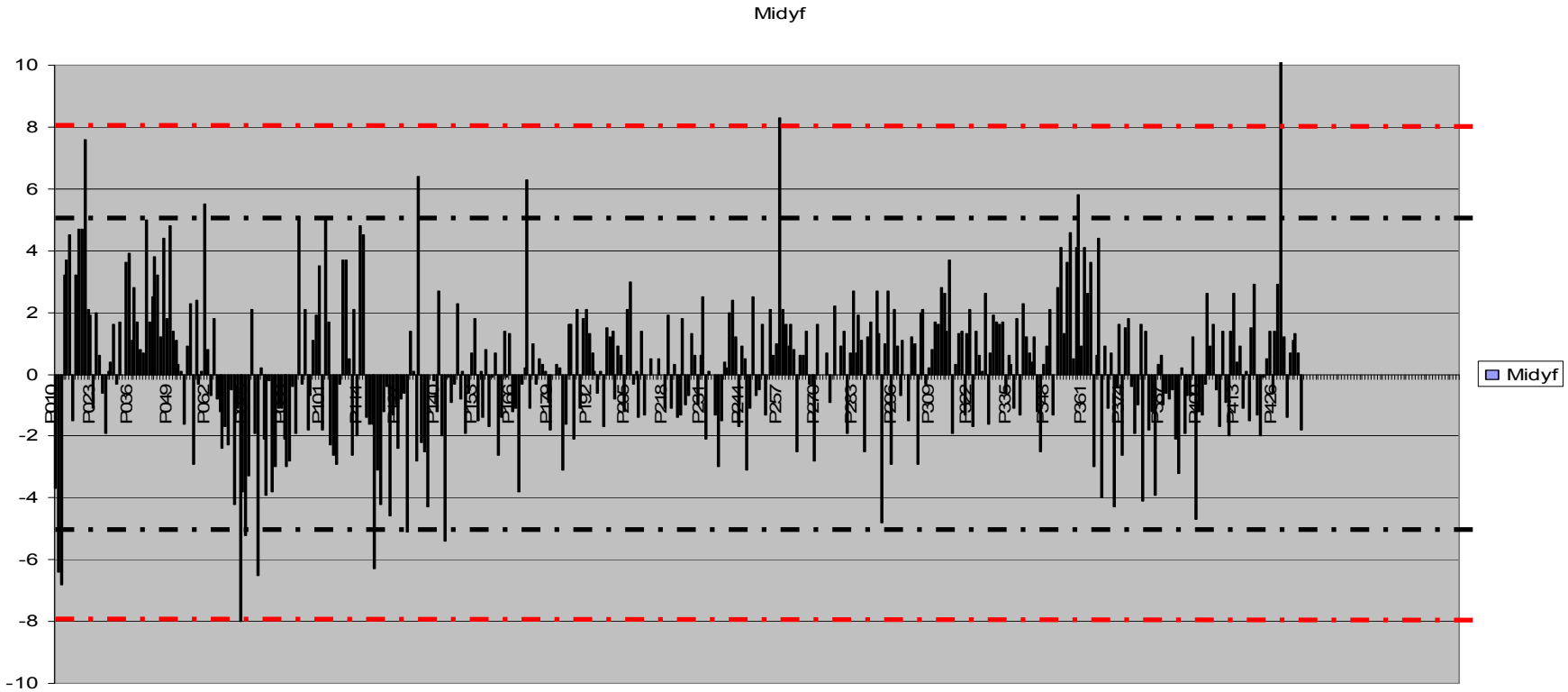
Production Model



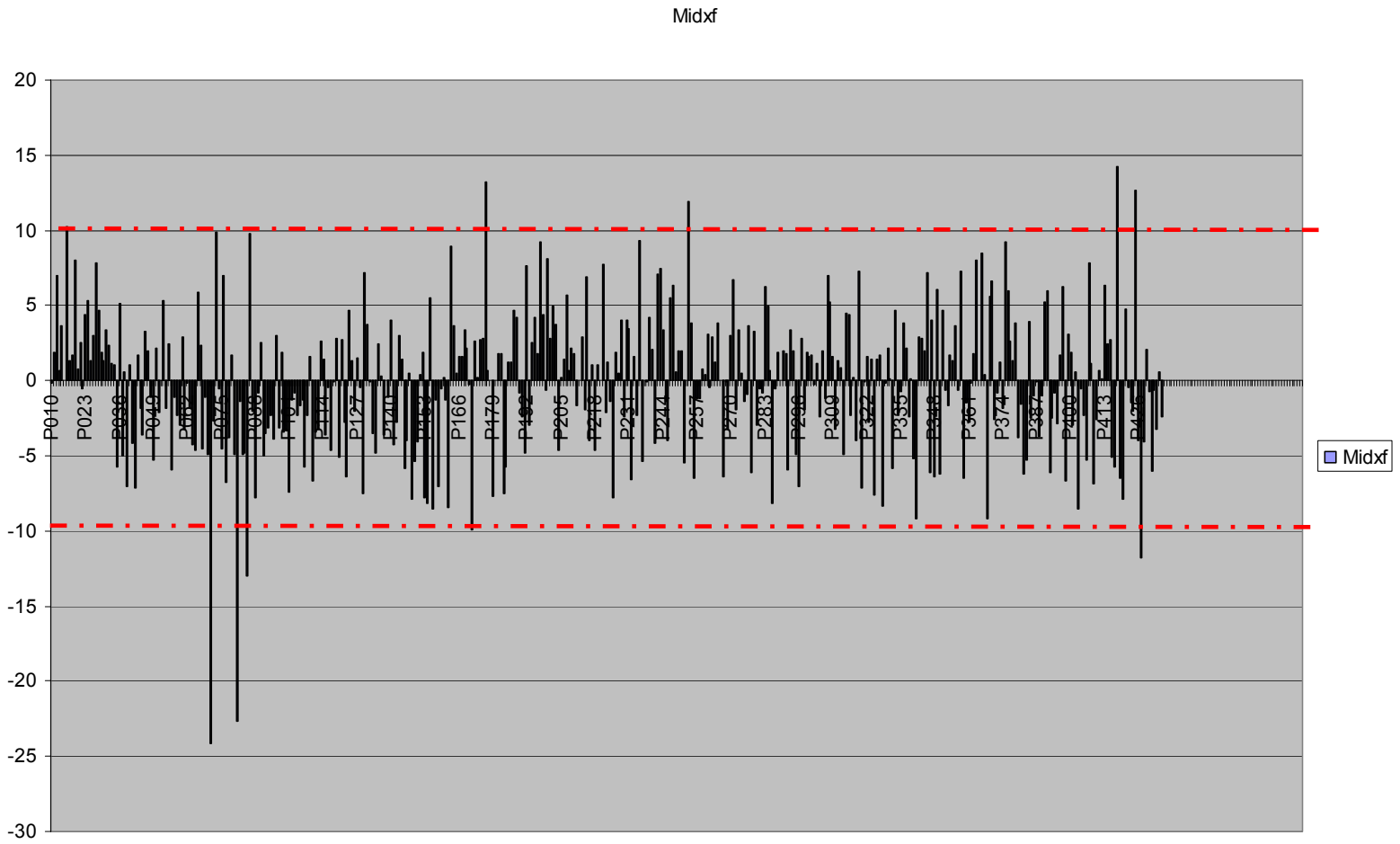
Shipping

- Shipping boxes and configuration adopted.
- Test shipment of 9 mechanical modules sent to RAL complete.
- No visual damage.
- Metrology done on 2, UK & USA agree.
- Mechanical shock loggers not set properly so no feedback, test underway on return shipment
- Digital shock logger needs to be specified by SCT
- Expect first real shipment of 20 in ~1 week

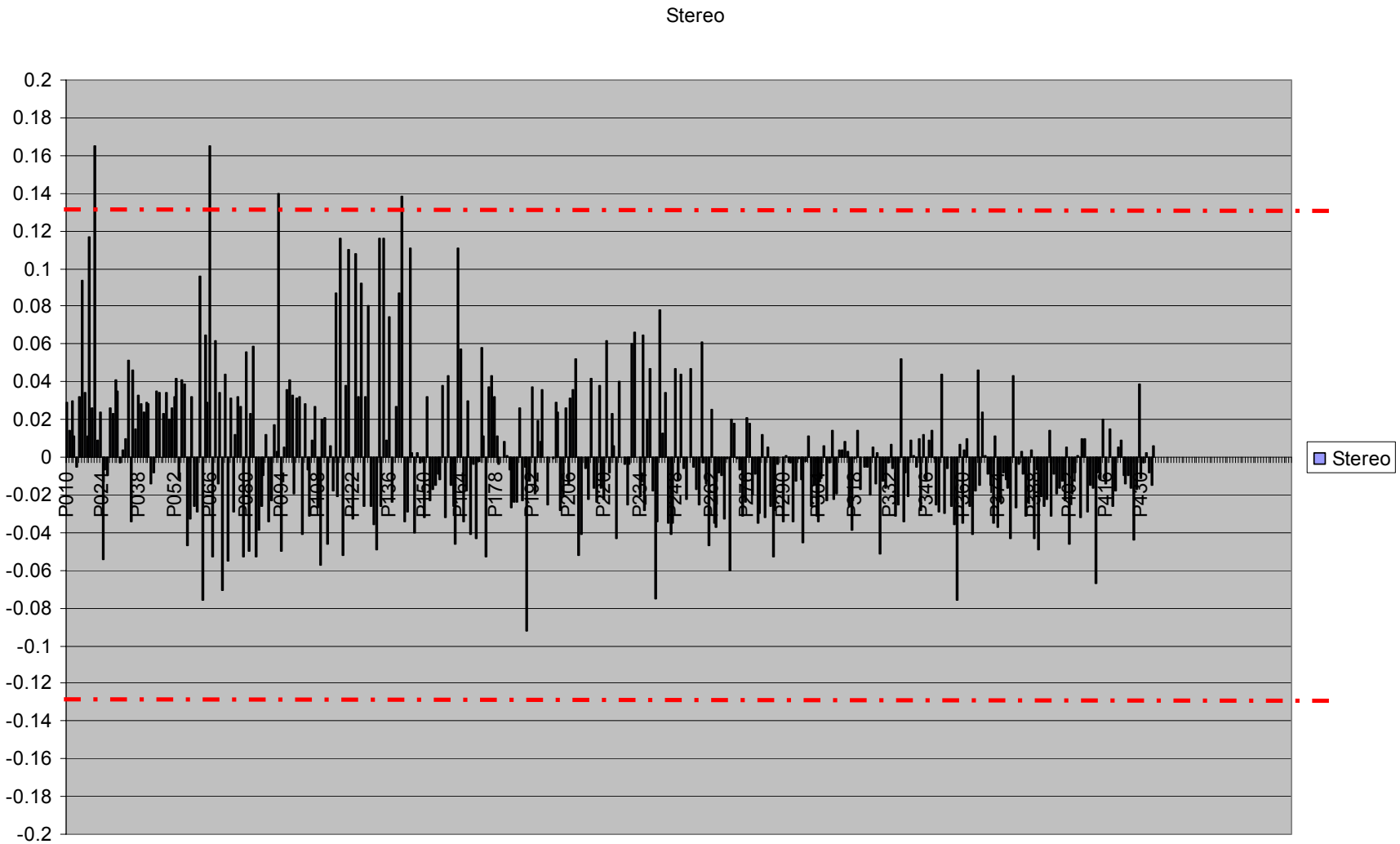
Metrology: Midyf history



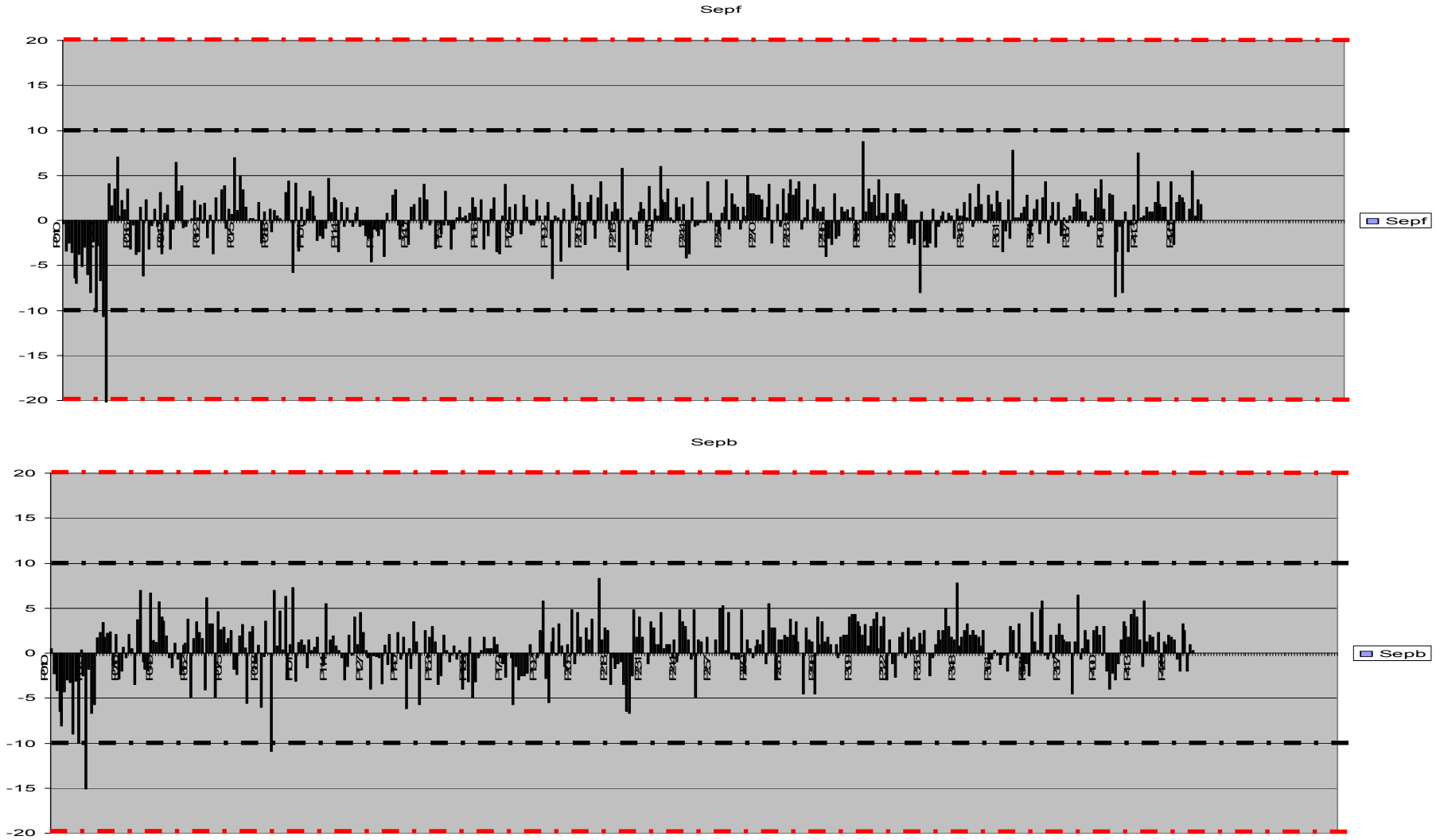
Midxf (10 μm)


Midxf
20
15
10
5
0
-5
-10
-15
-20
-25
-30
P010
P023
P049
P127
P166
P470
P205
P231
P244
P257
P270
P283
P309
P322
P335
P361
P374
P387
P400
P413
Midxf

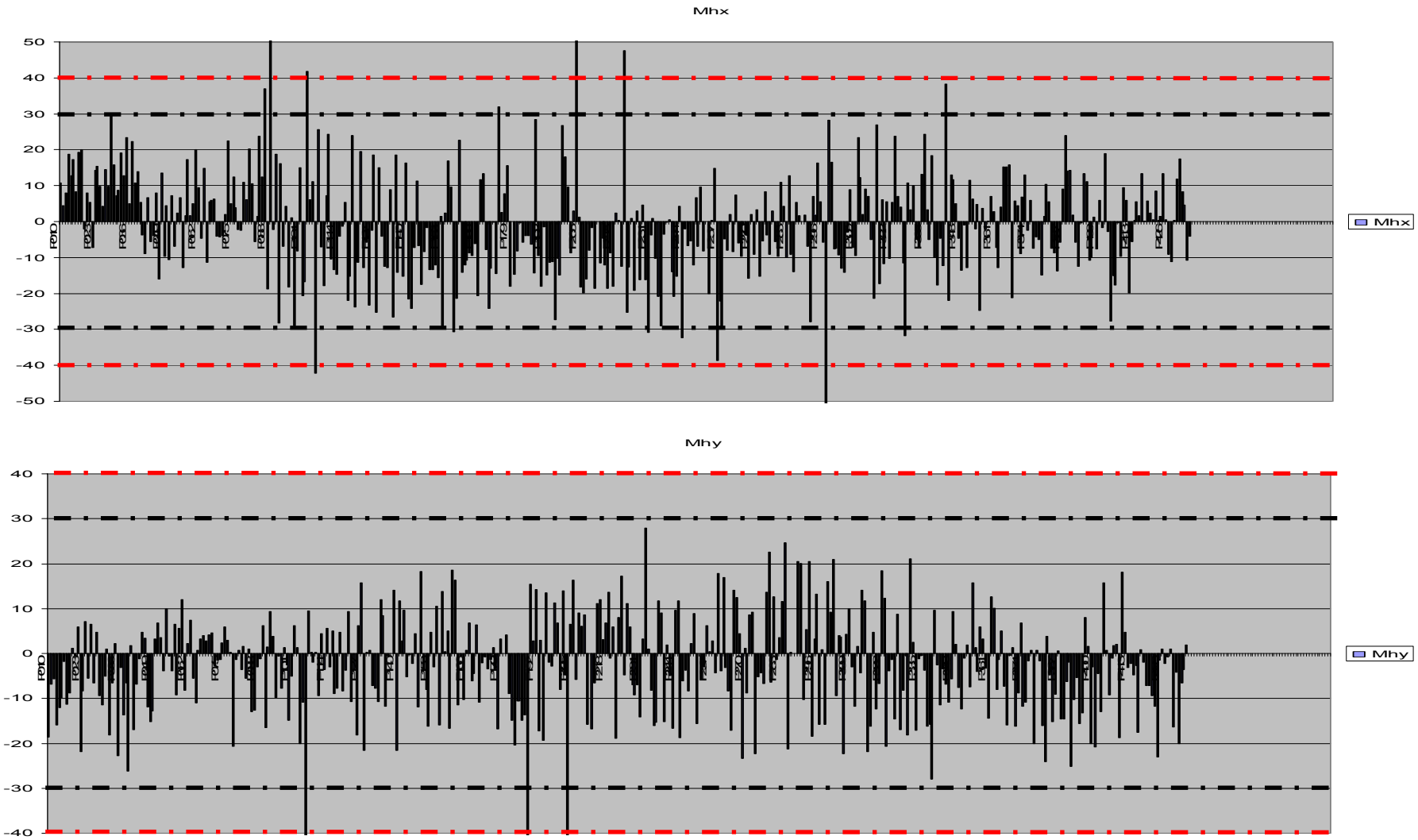
Stereo Angle (130 mrad)



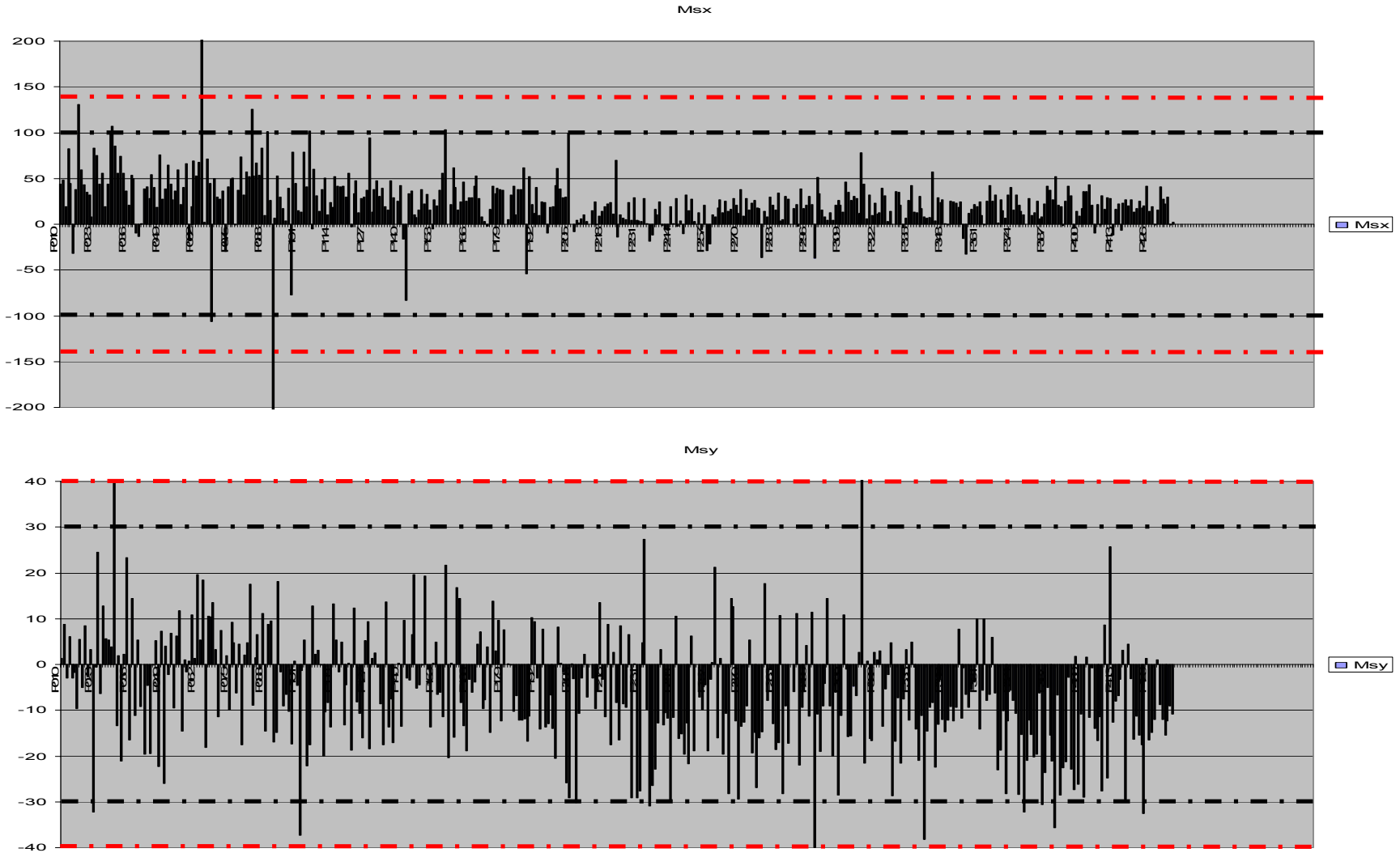
Sepf and Sepb (10 μm)



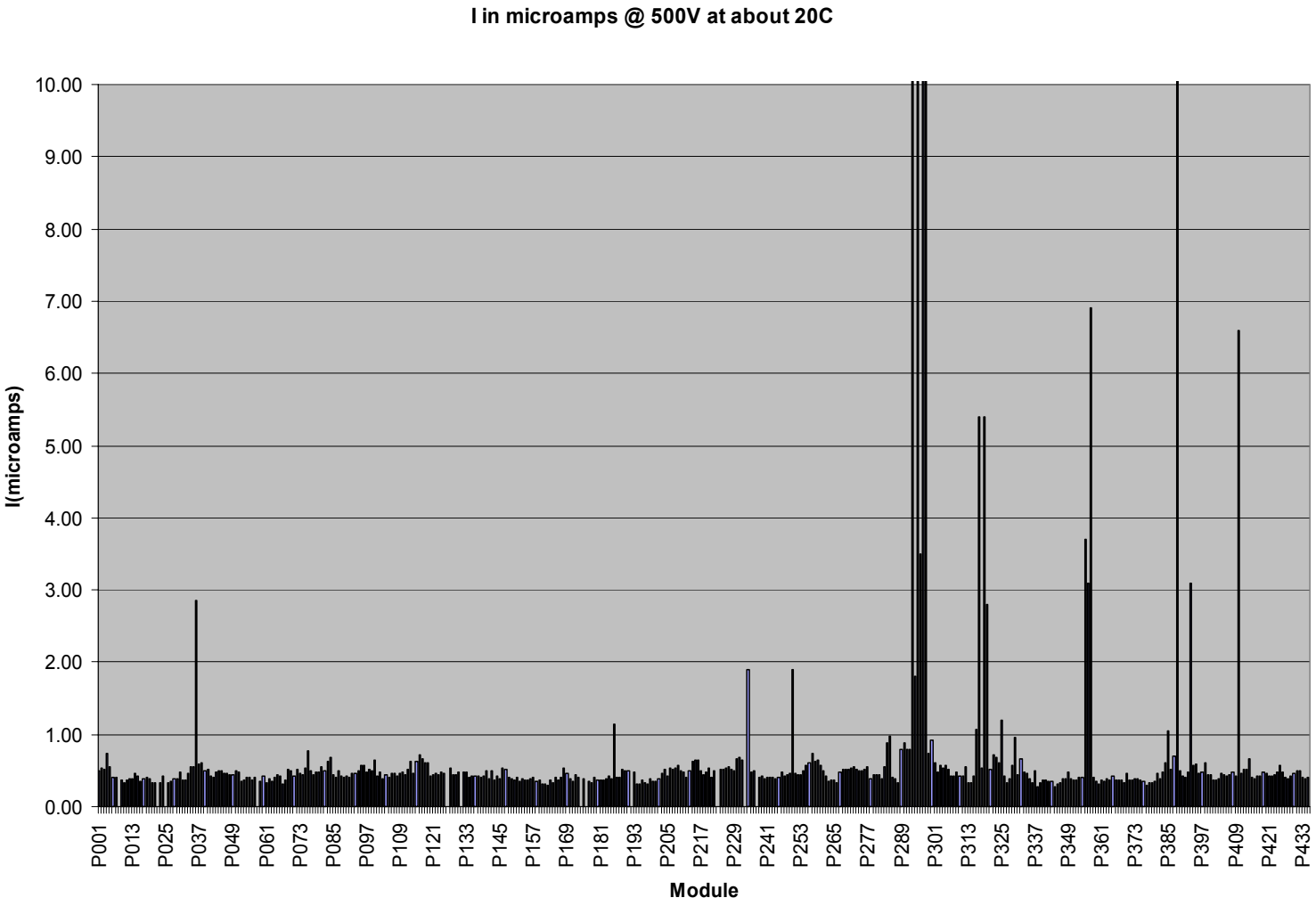
Hole


Mhx
50
40
30
20
10
0
-10
-20
-30
-40
-50
Mhx
Mhy
40
30
20
10
0
-10
-20
-30
-40
Mhy

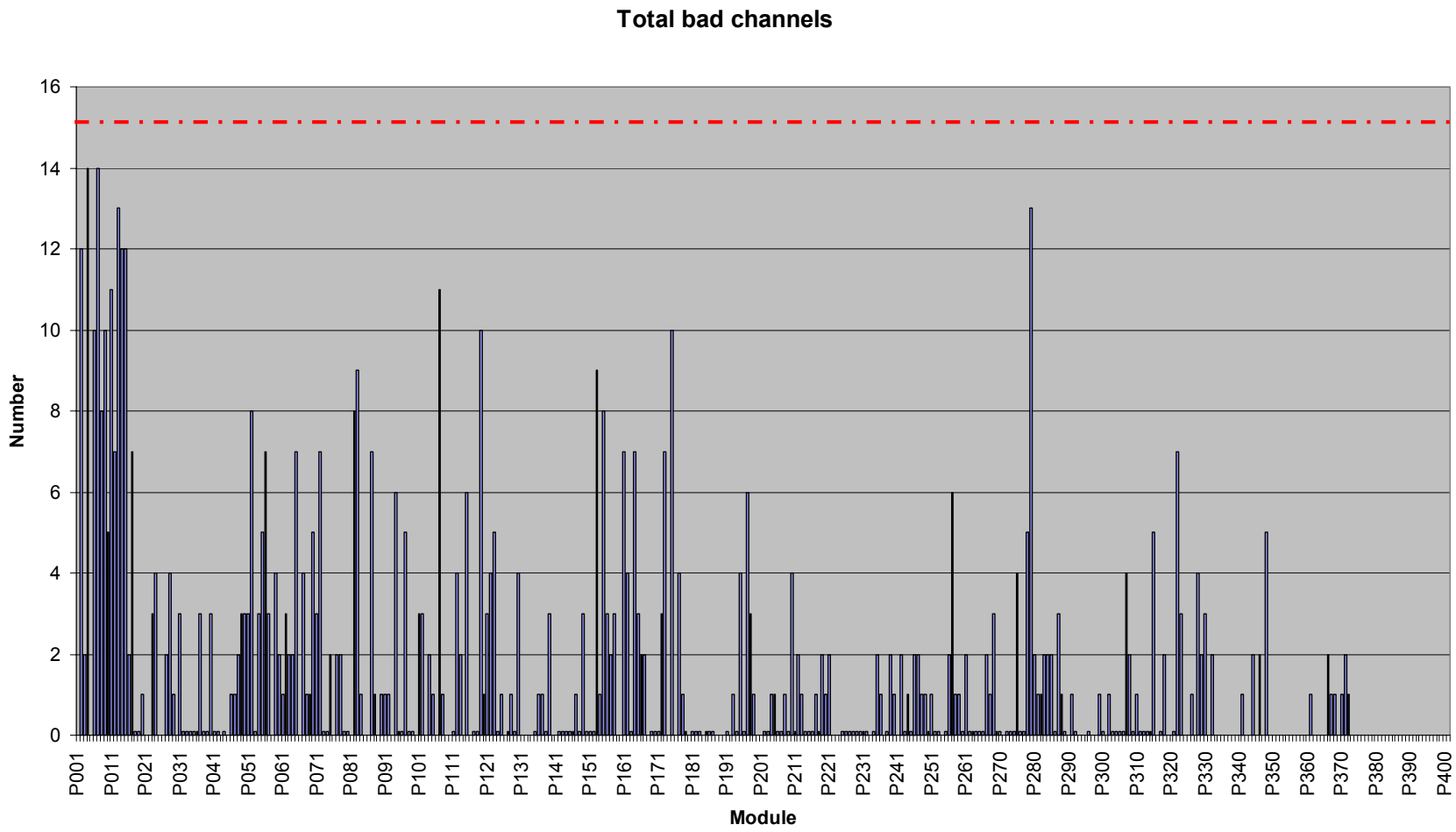
Slot


Msx
200
150
100
50
0
-50
-100
-150
-200
Msx
Msy
40
30
20
10
0
-10
-20
-30
-40
Msy

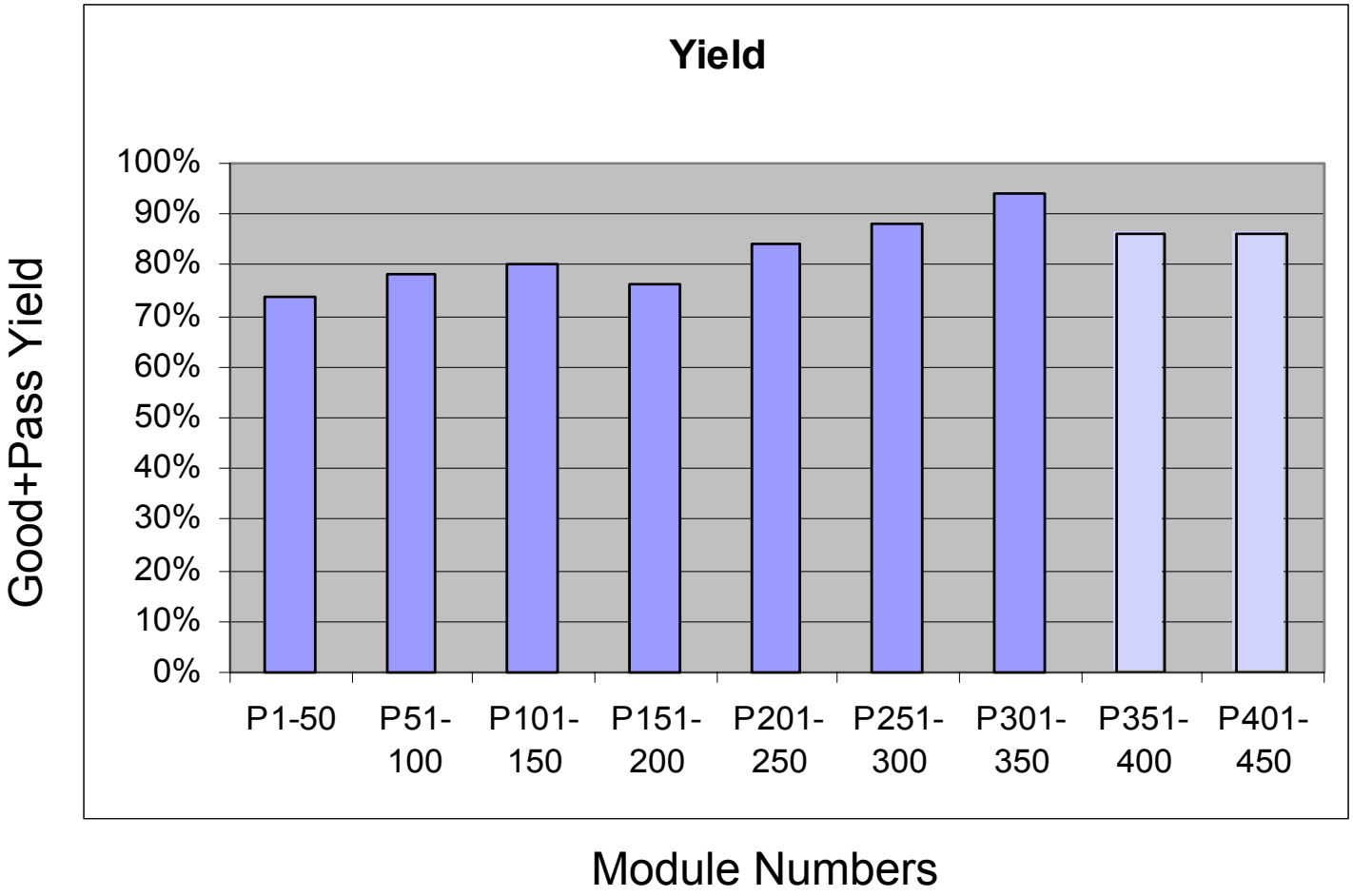
Leakage Current of 4 Wafers



Bad Channels per Module



Module Yields - Classified



Module Categories

	378	ATLAS Classified
69%	260	ATLAS Good
80%	303	ATLAS Good+Pass
94%	355	ATLAS Good+Pass+Hold
96%	362	ATLAS Good+Pass+Hold+Rework

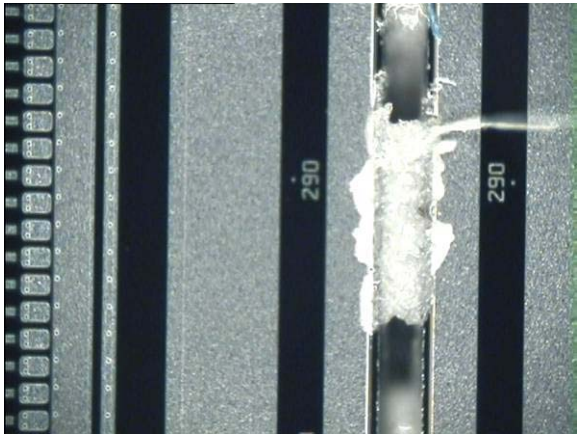
Hold Categories – 61

- Hold spreadsheet prepared and submitted
- Metrology: 26 with parameters outside PASS, most are due to small deviations
- Leakage current : 9 which don't condition, 3 which are on the margin
- Leakage glue: 10
  - 3 only in gap
  - 2 with minimal glue onto surface
  - 5 with glue on surface but not on pads
  - Most of these occurred early, rate now is ~once every hundred modules. May be due to shim round-off error.
- Other: ~9 have slight mechanical damage on PA or on edge of silicon, most otherwise perform well.

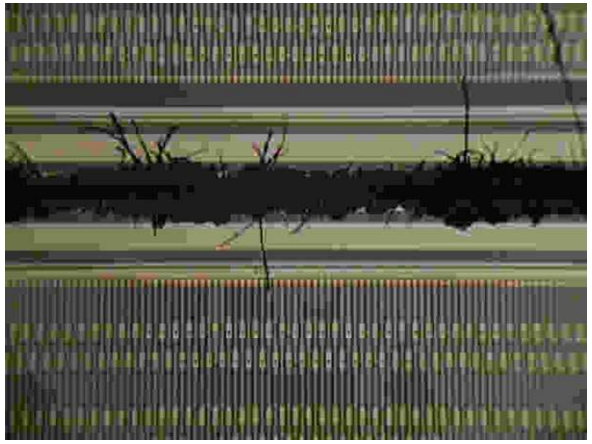
Position on HOLDS/FAILS

- On spreadsheet have indicated USA assessment of most HOLD and FAIL
- Would like those which pass to enter the workflow now so they can be absorbed gradually.
- Position
  - Most mechanicals out of spec should be used.
  - Parts with glue in crack or on surface but not on pads should be used.
  - Parts with slight mechanical damage but good IV should be judged now by module community (see pictures)

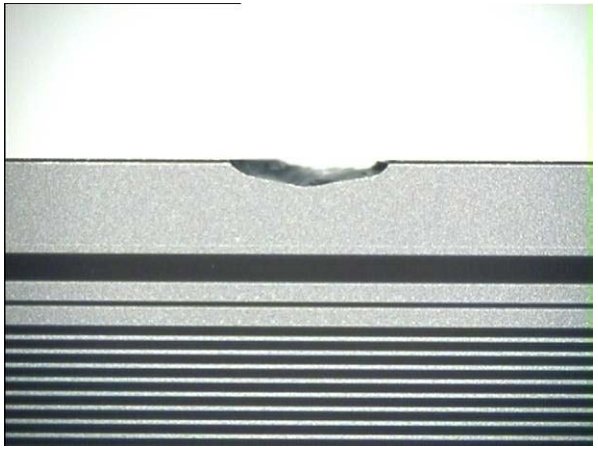
Examples of damage: these SB have good IV curves



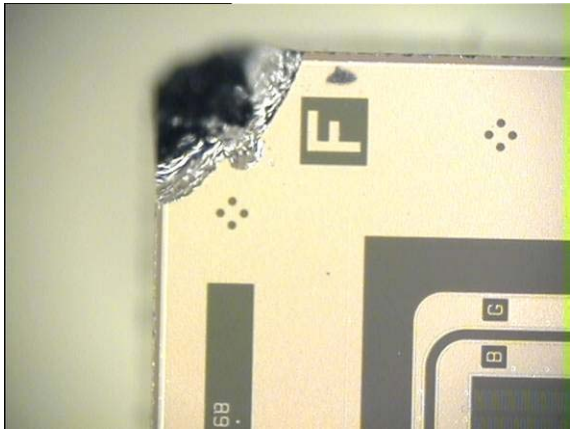
Minimal glue leakage



Larger area glue leakage



Edge chip damage



Corner chip damage

Fail and Rework Categories

- Metrology: 2
  - Completely off due to wrong DIMS file
  - Vacuum failure during cure
- Broken or damaged: 4
  - Accidents
- Reworks: 7
  - 3 are hybrids too high
    - Have fixed one so far with hot wire to cut glue under foot
    - Expect to repair others eventually
  - 4 are bond damage or dirty
    - Expect to repair with some add'n bad channel or leakage