

Time Histories of DSA323 Strain Gauge Data

Jim Strait
6/5/91

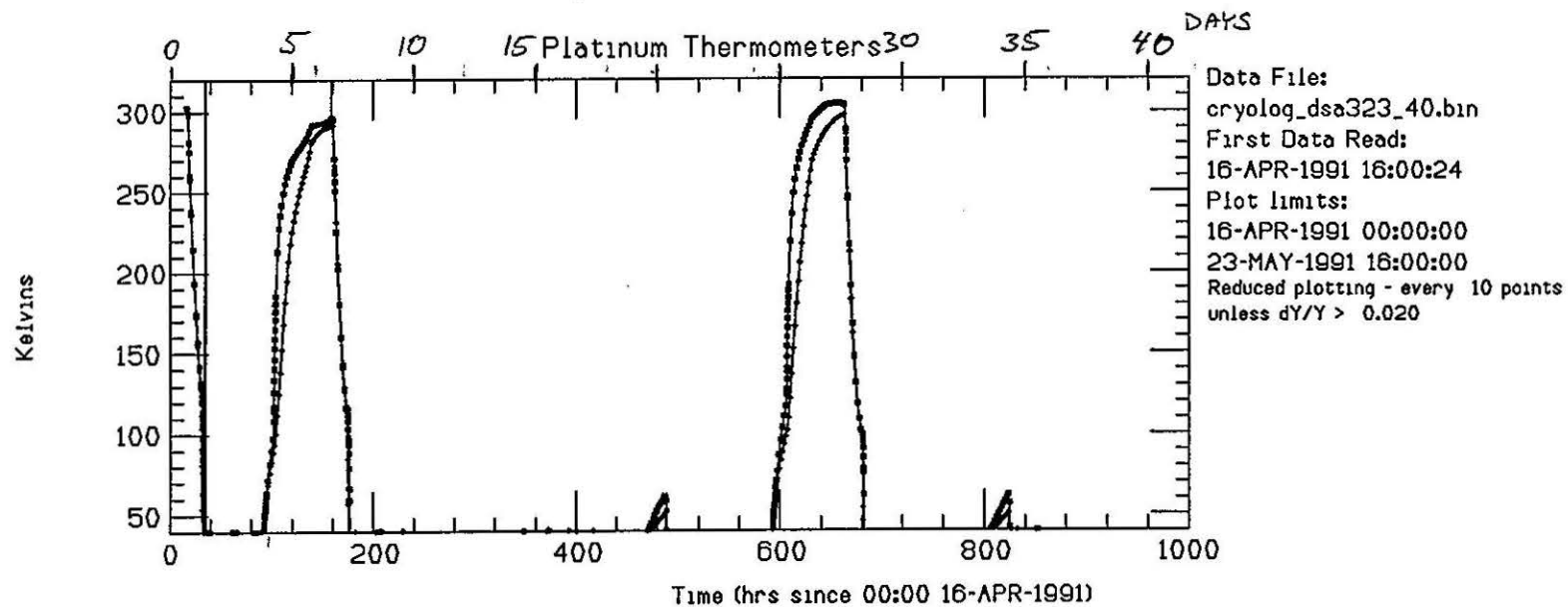
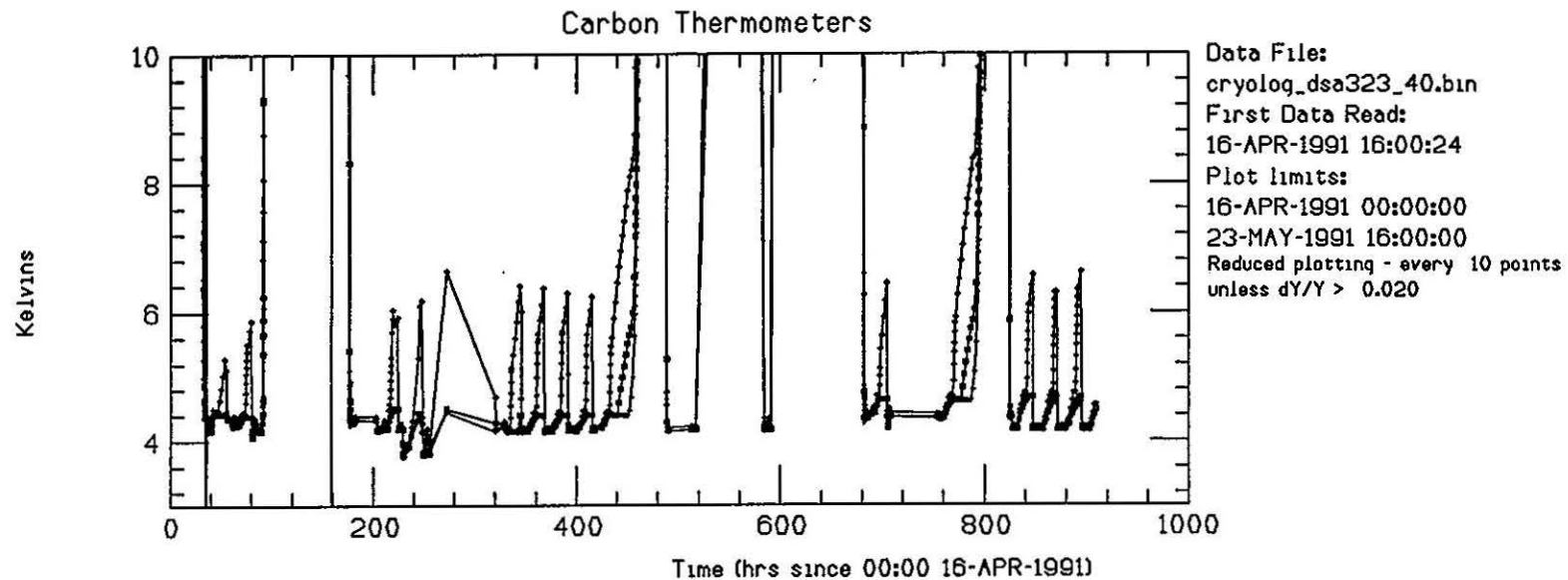
Attached are plots giving the time histories of data from most of the strain gauges on DSA323. The first set of plots (TopDrawer plots) are of the carbon and Platinum thermometers, dewar pressure, liquid level, shell (skin) strain gauges, collar pack gauges, bullet gauges and end can gauges covering the 1st, 2nd and most of the 3rd cooldowns, from 4/11/91 through the middle of 5/23/91. (The plots end there because of a limitation on the number of records that CryoPlot can read in one job.) The data are not cut on temperature or magnet current, but since the strain gauges are not calibrated for temperatures intermediate between room and liquid helium temperatures, the vertical scales have been set to emphasise the 300 K and 4 K data and to ignore the transients during cooldown.

The shell gauges record the change in strain from the initial state at the beginning of testing at 300 K and separately from the initial state at 4 K at the end of the first cooldown. The end can gauges measure strain relative to the unstressed can before assembly at room temperature, but record only the change from the initial state at 4 K after the first cooldown. No cold calibrations were measured. Incorrect values of the cold stress-strain calibrations for the collar pack gauges were used on the first cooldown, so the data for these gauges for $30 < t < 100$ hours should be ignored.

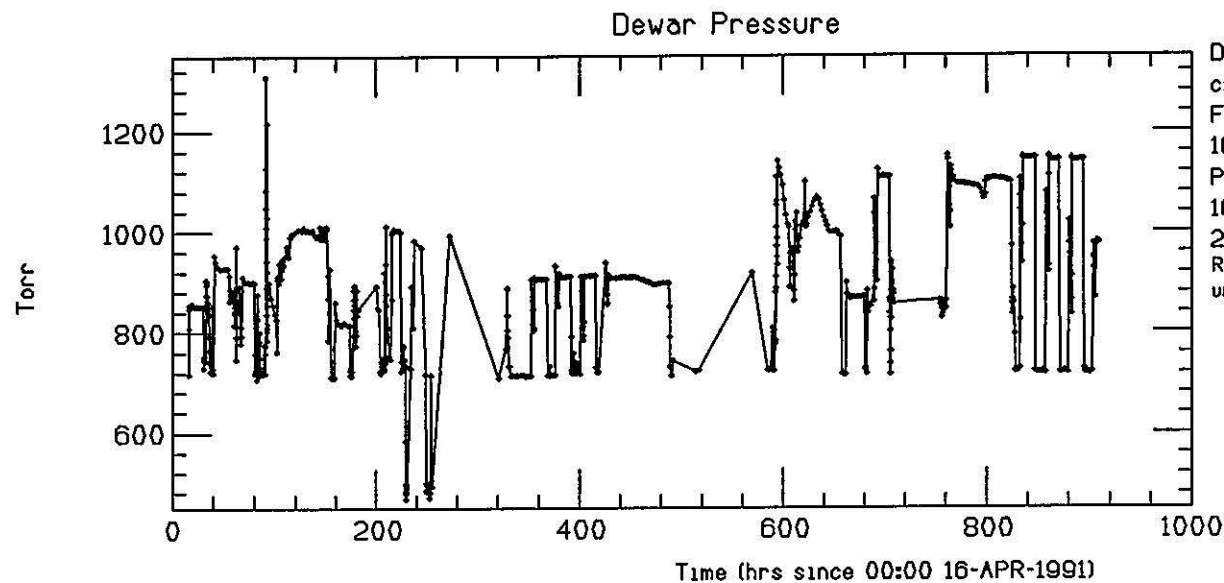
The locations of the shell and end cap gauges are noted in the plot titles. The z coordinate is the distance in mm from the center of the magnet with positive z towards the return end. For the shell gauges "A" is the circumferential distance in mm from the weld at the vertical parting plane. For the end clamp gauges ϕ is the angle from the positive x -axis as viewed from the lead end of the magnet.

The second set of plots (2020 plots) show the full time histories for all four cooldowns of all the gauges except those on the end clamp. However, the strain gauge data are plotted only for $T < 4.5$ K as measured by the top carbon thermometer. The four 4 K test periods are noted on the first shell gauge plot. No cut was made on magnet current, so large excursions occur on these plots for cases of $I > 0$. Shell gauges labeled "A"("z") measure azimuthal (axial) strain. The position of each gauge is given by its angle from the weld and its z coordinate. The collar pack data from the first cooldown are not plotted for the reason noted above.

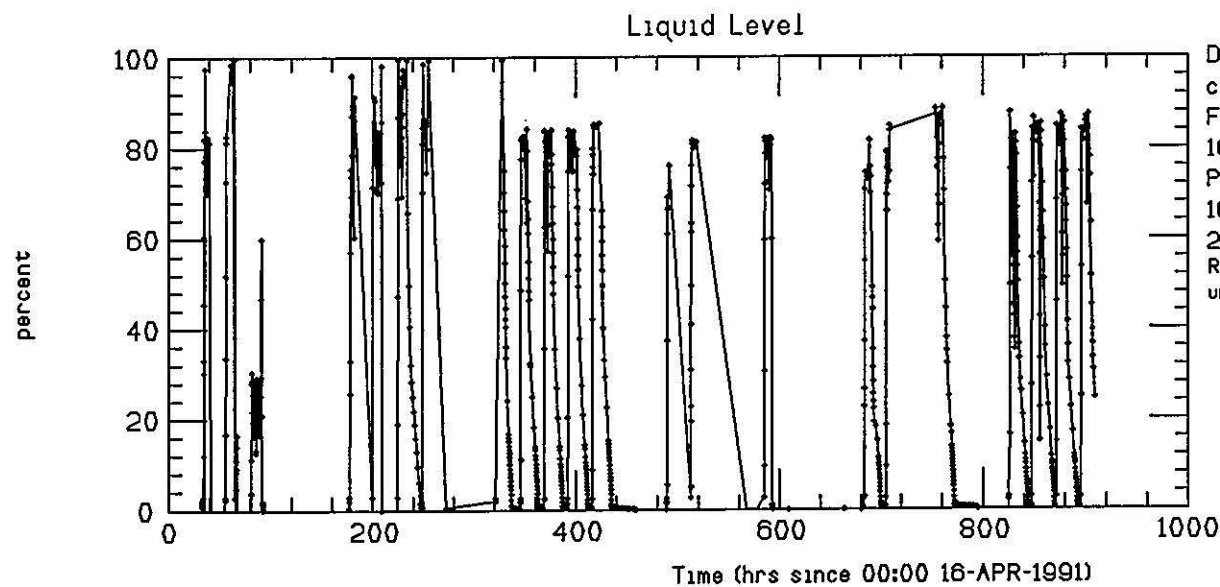
3-JUN-91 11:49:33



3-JUN-91 11:54:12

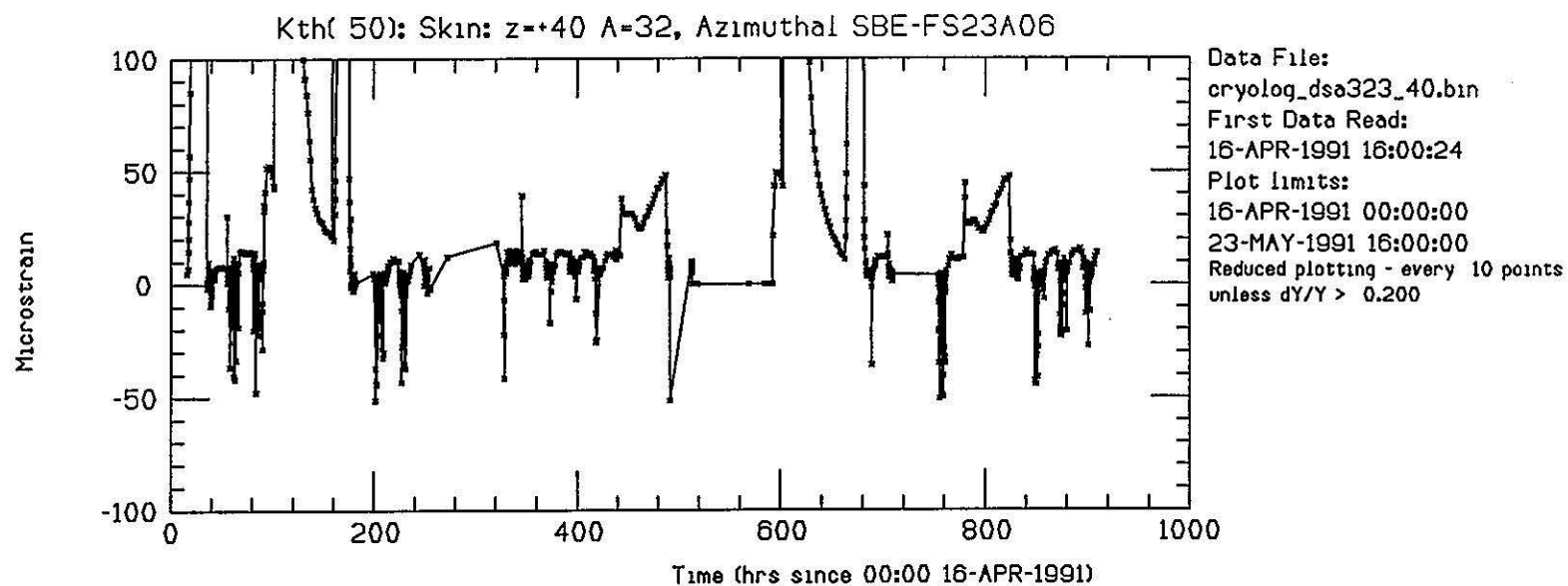
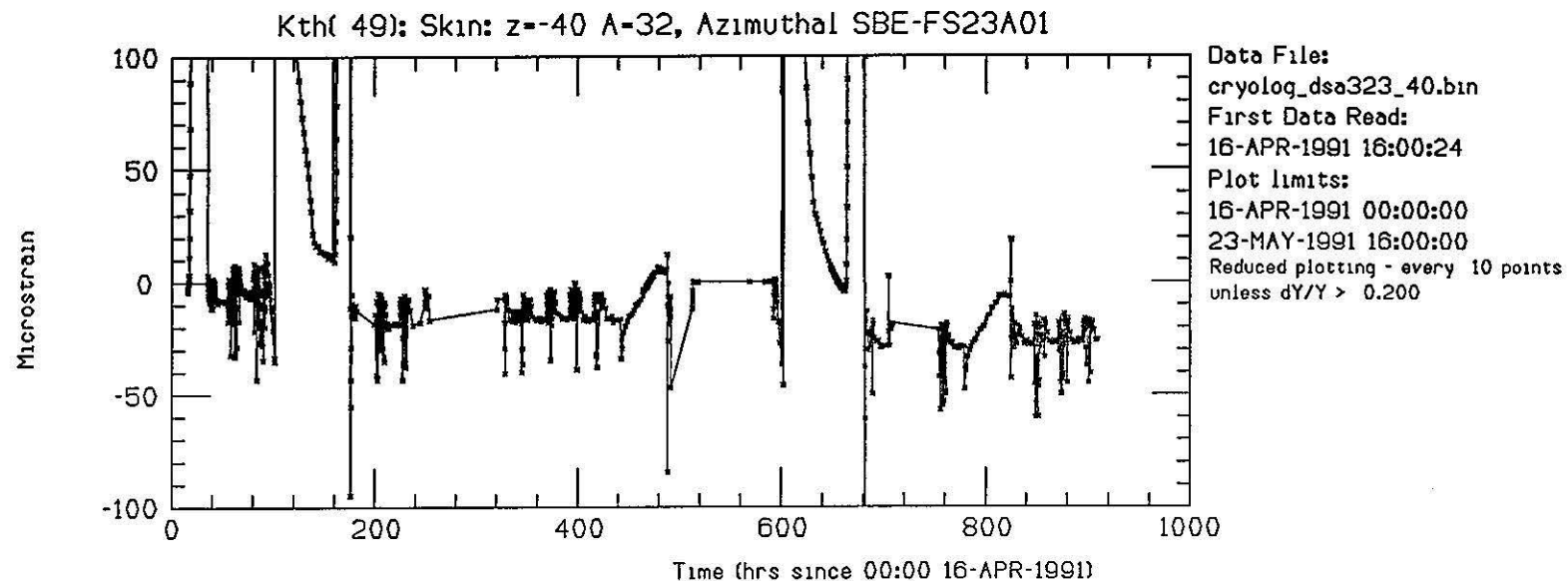


Data File:
cryolog_dsa323_40.bin
First Data Read:
16-APR-1991 16:00:24
Plot limits:
16-APR-1991 00:00:00
23-MAY-1991 16:00:00
Reduced plotting - every 10 points
unless $dY/Y > 0.020$

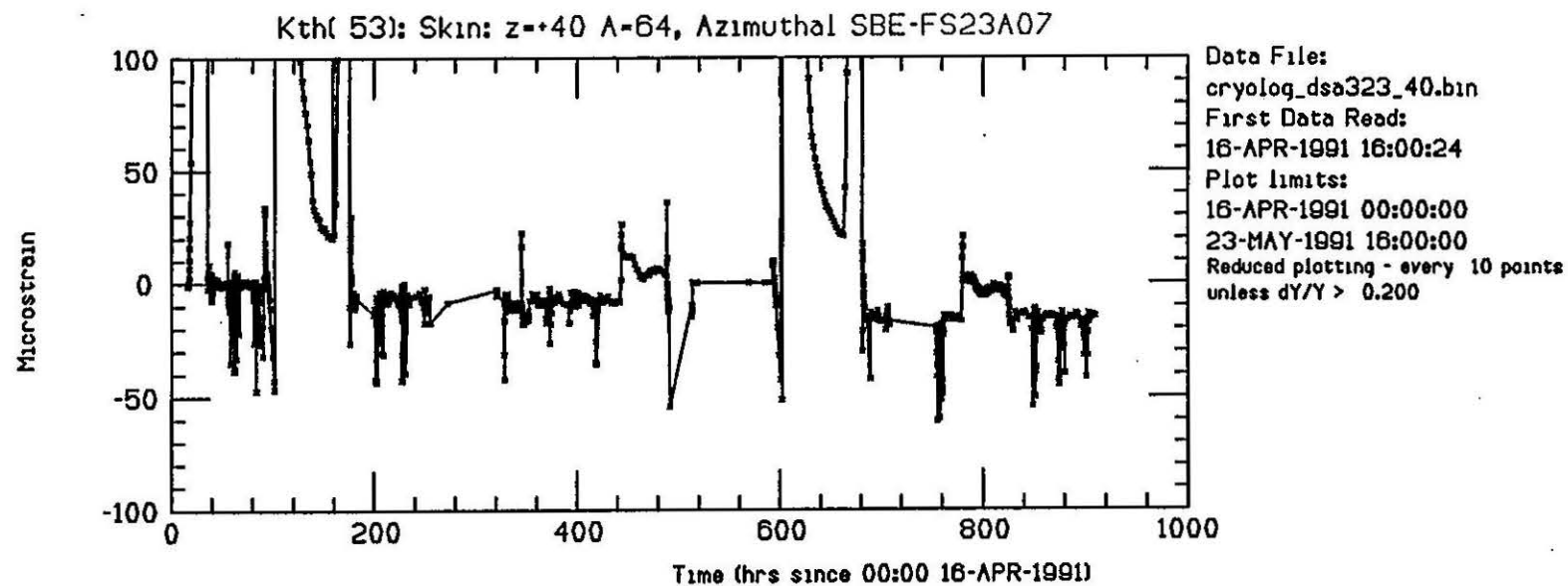
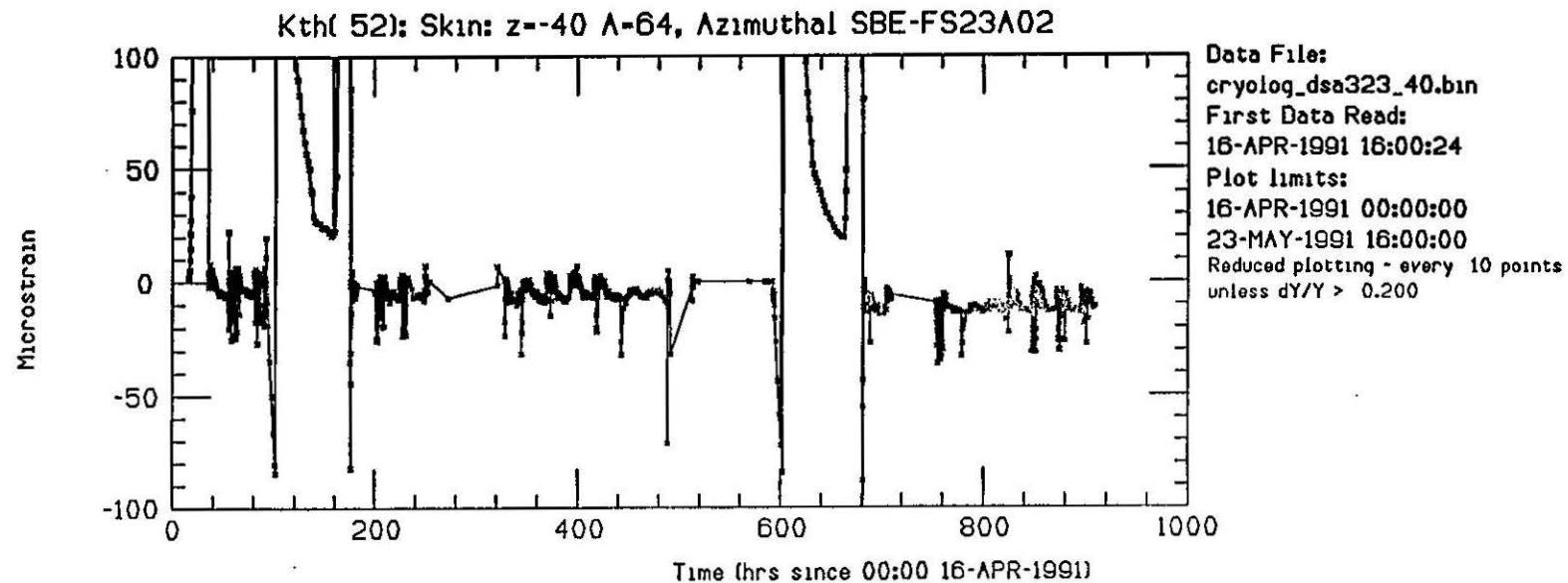


Data File:
cryolog_dsa323_40.bin
First Data Read:
16-APR-1991 16:00:24
Plot limits:
16-APR-1991 00:00:00
23-MAY-1991 16:00:00
Reduced plotting - every 10 points
unless $dY/Y > 0.050$

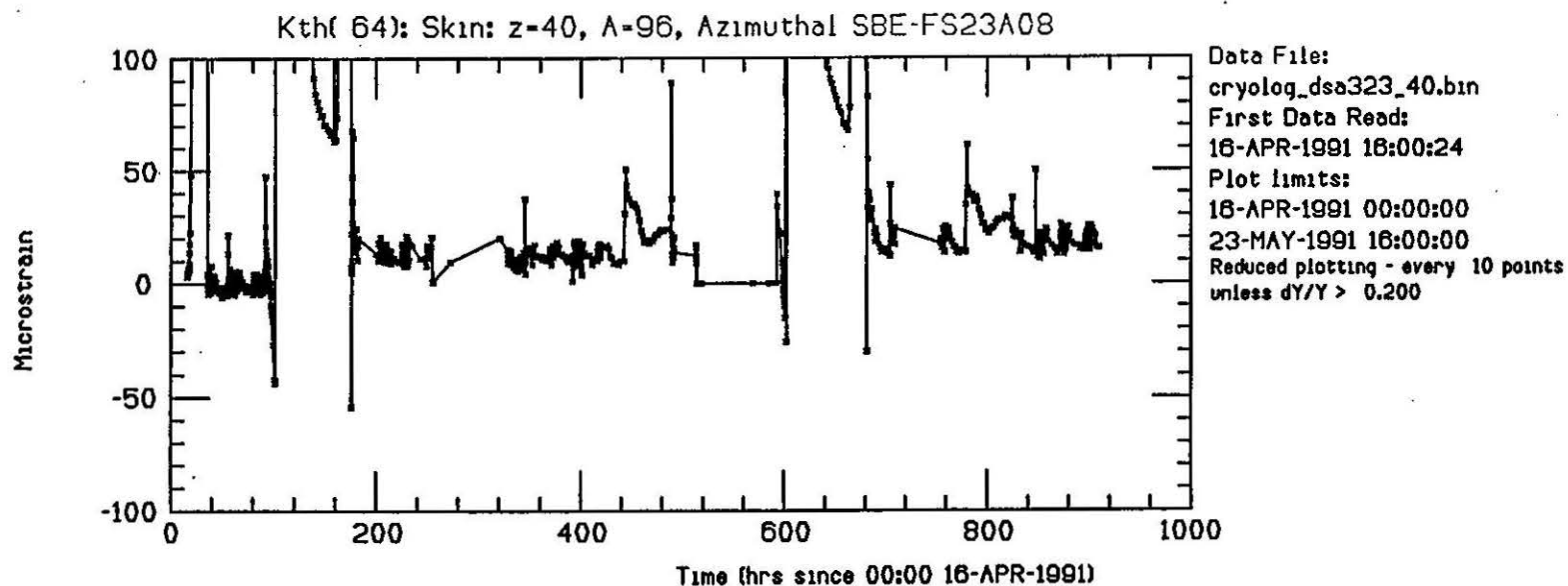
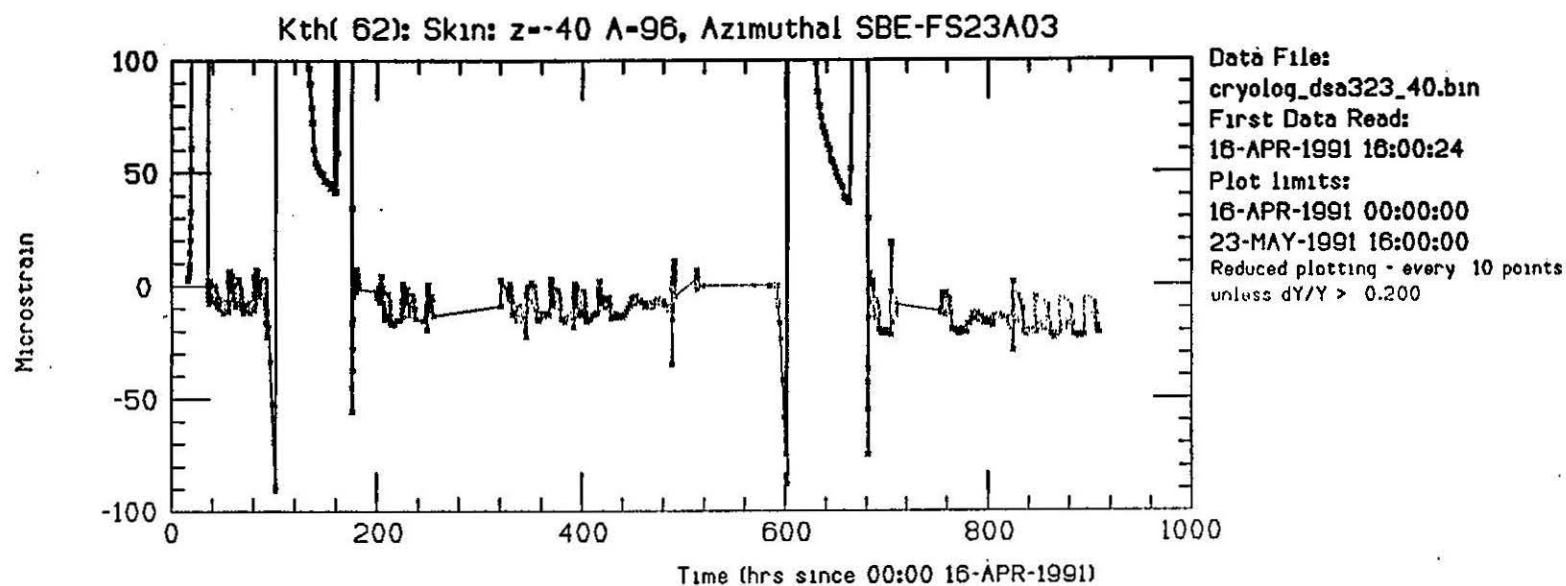
3-JUN-91 16:17:03

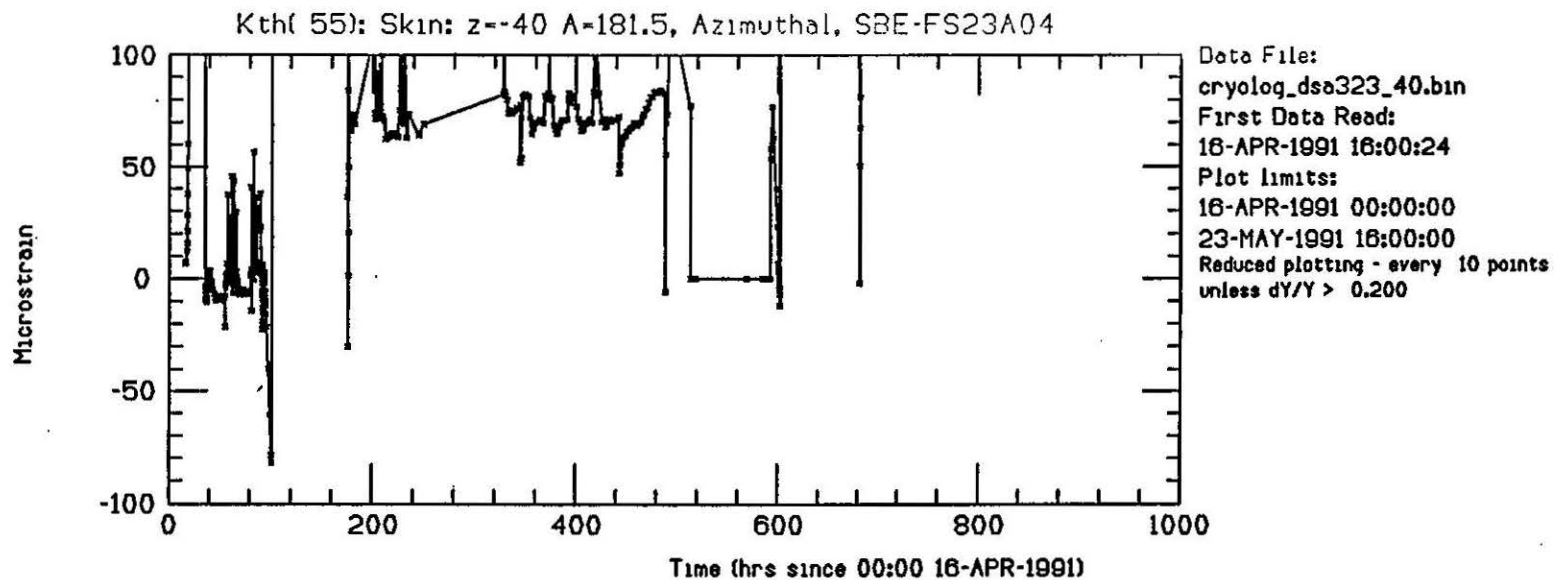


3-JUN-91 16:18:36

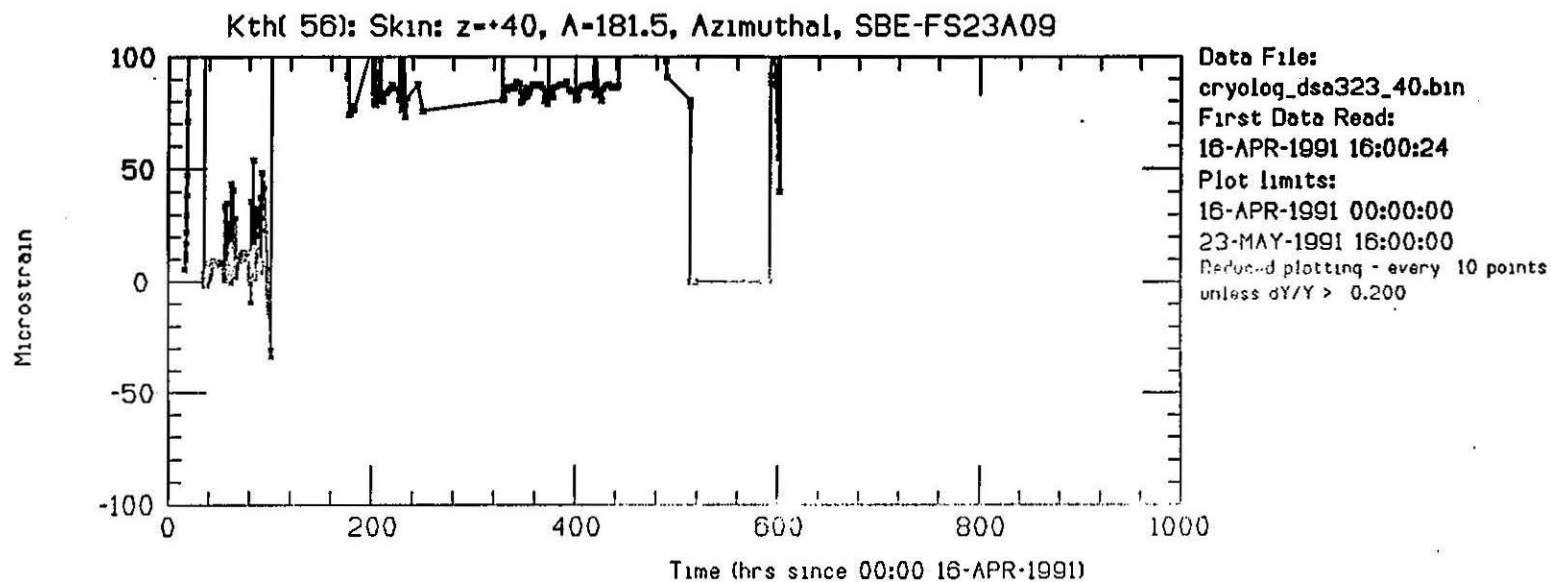


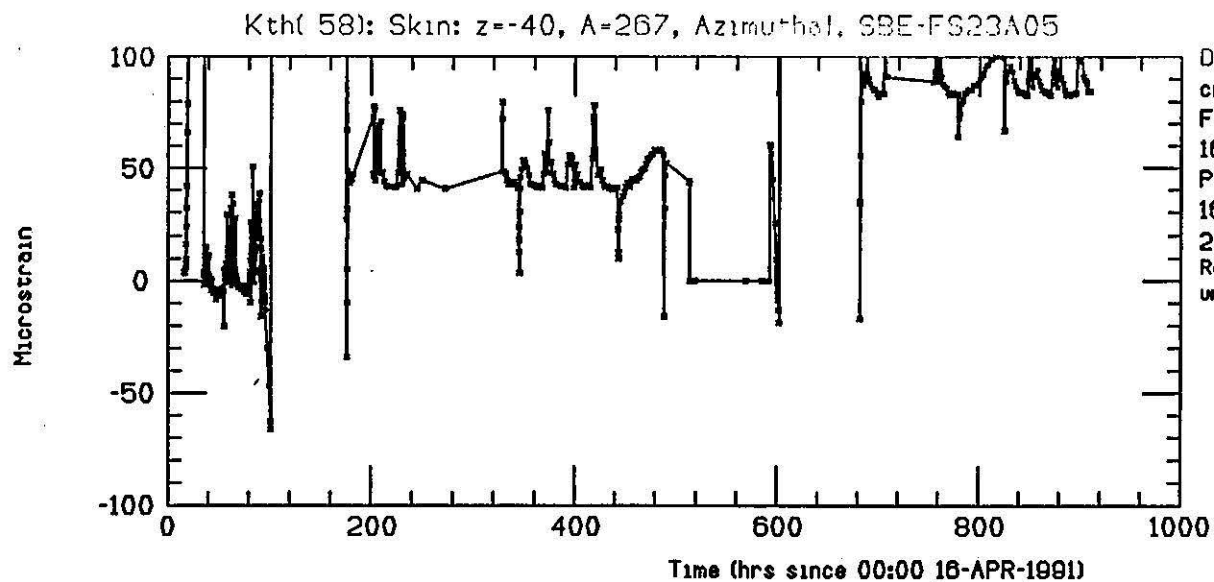
3-JUN-91 16:23:28



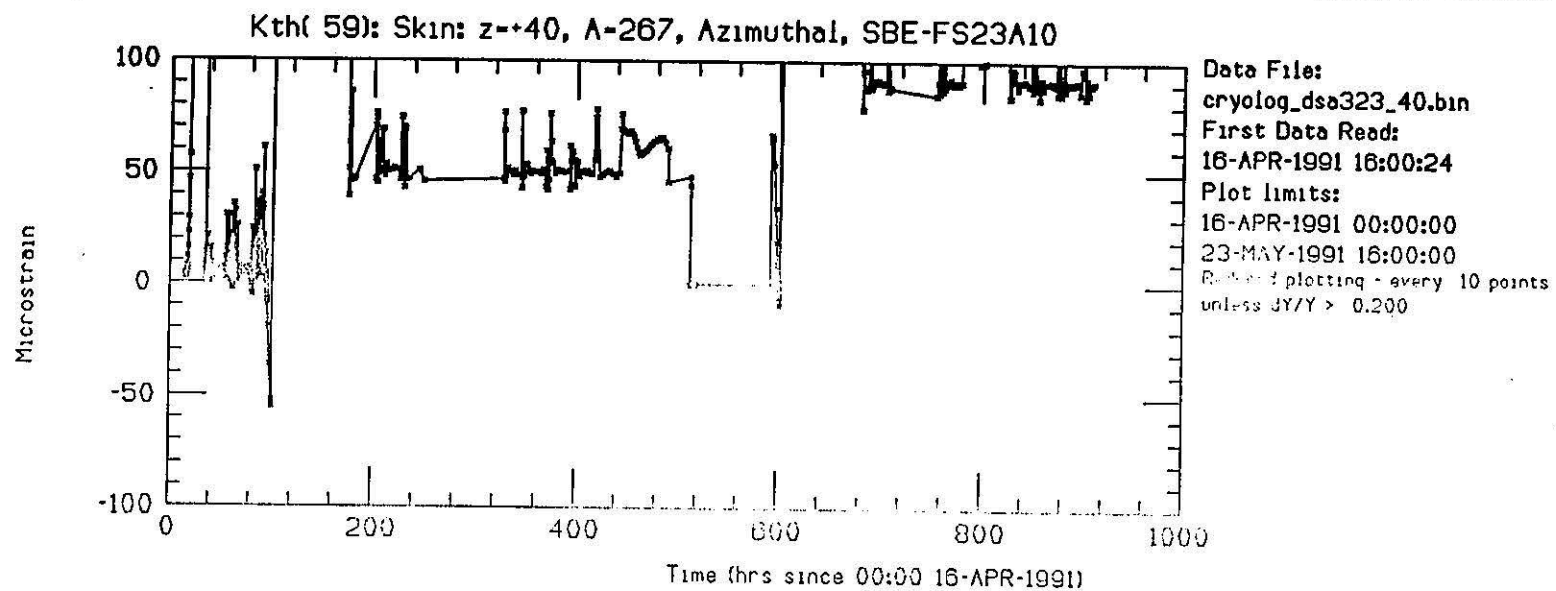


3-JUN-91 16:25:10

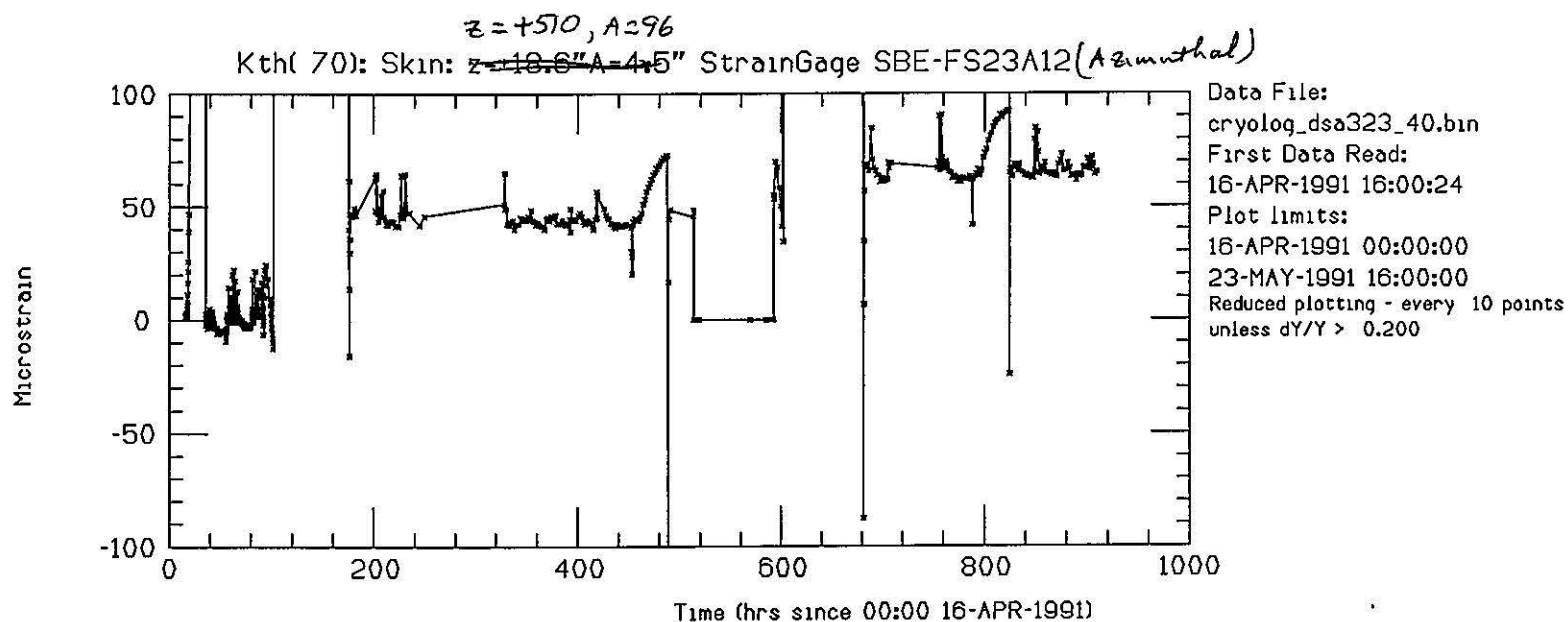
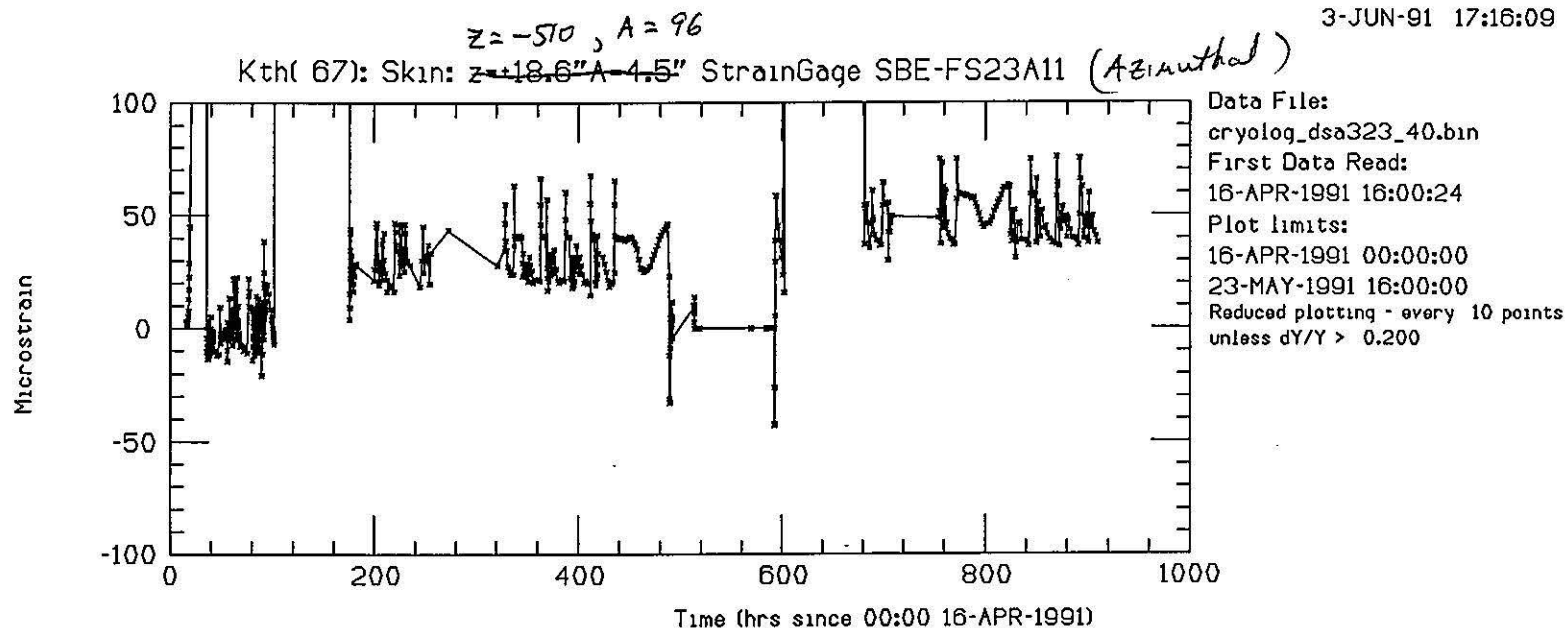


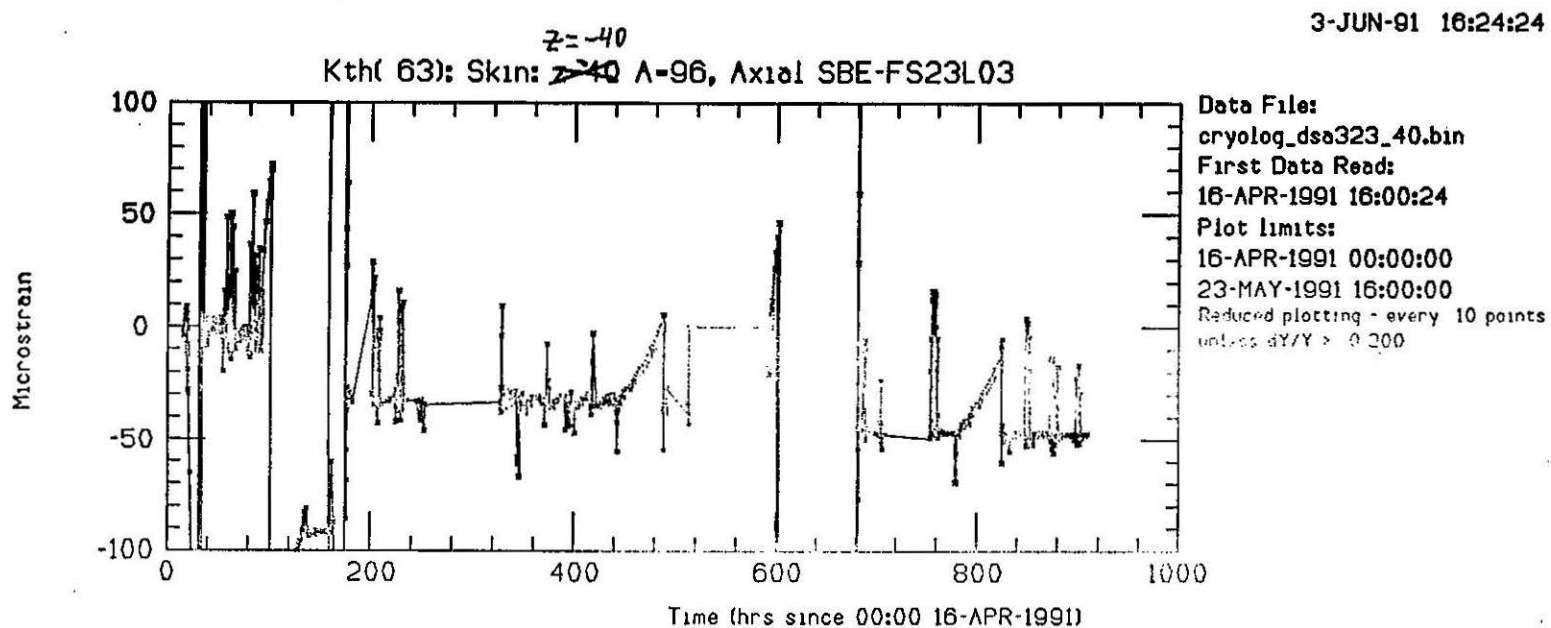
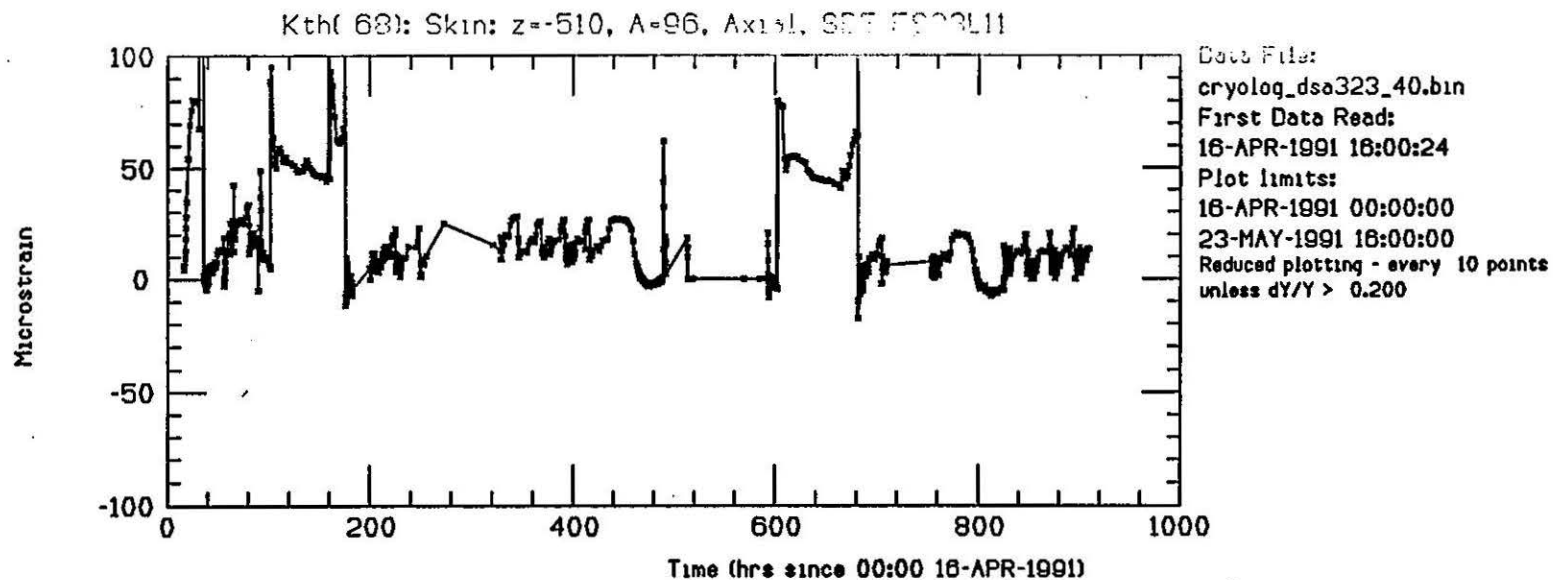


3-JUN-91 16:26:03

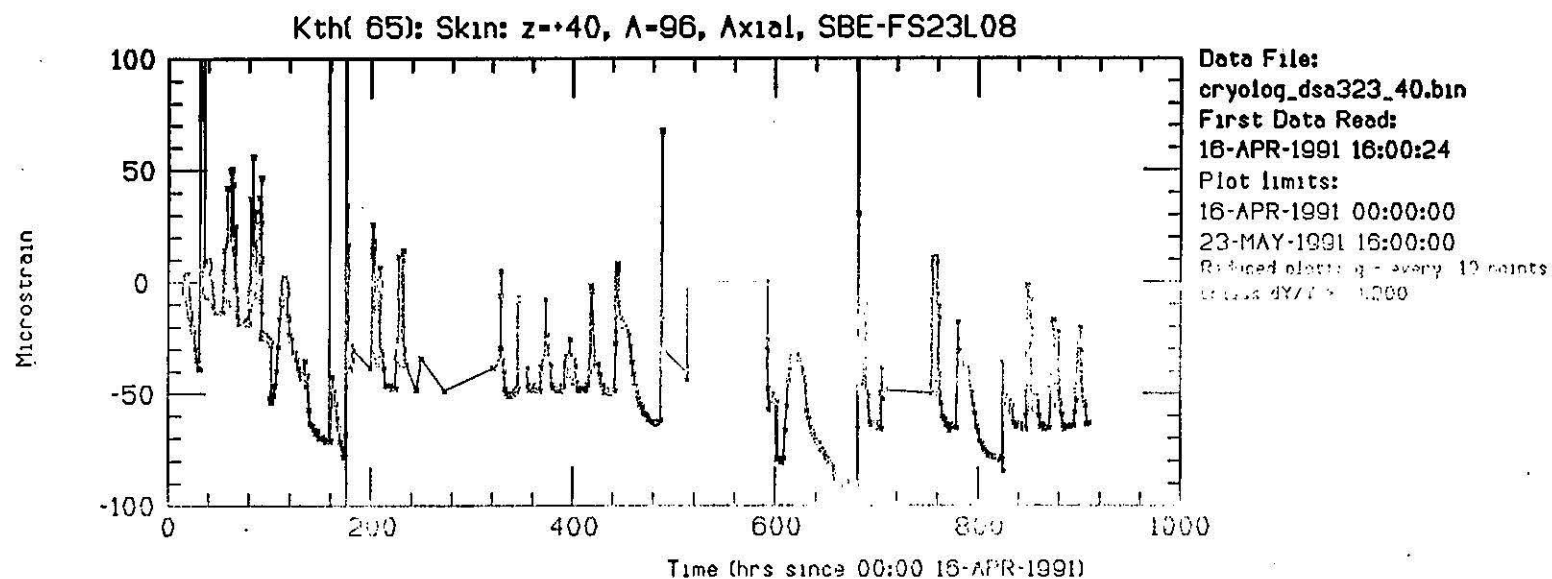


3-JUN-91 17:16:09

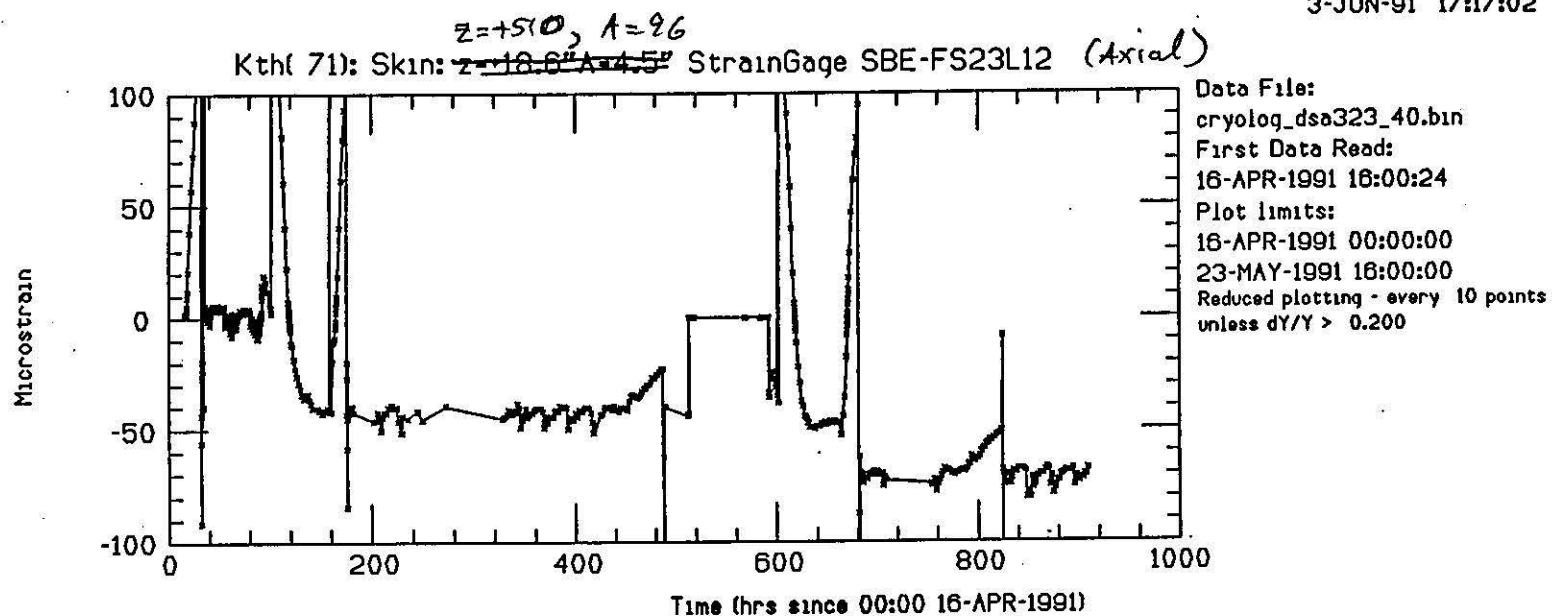




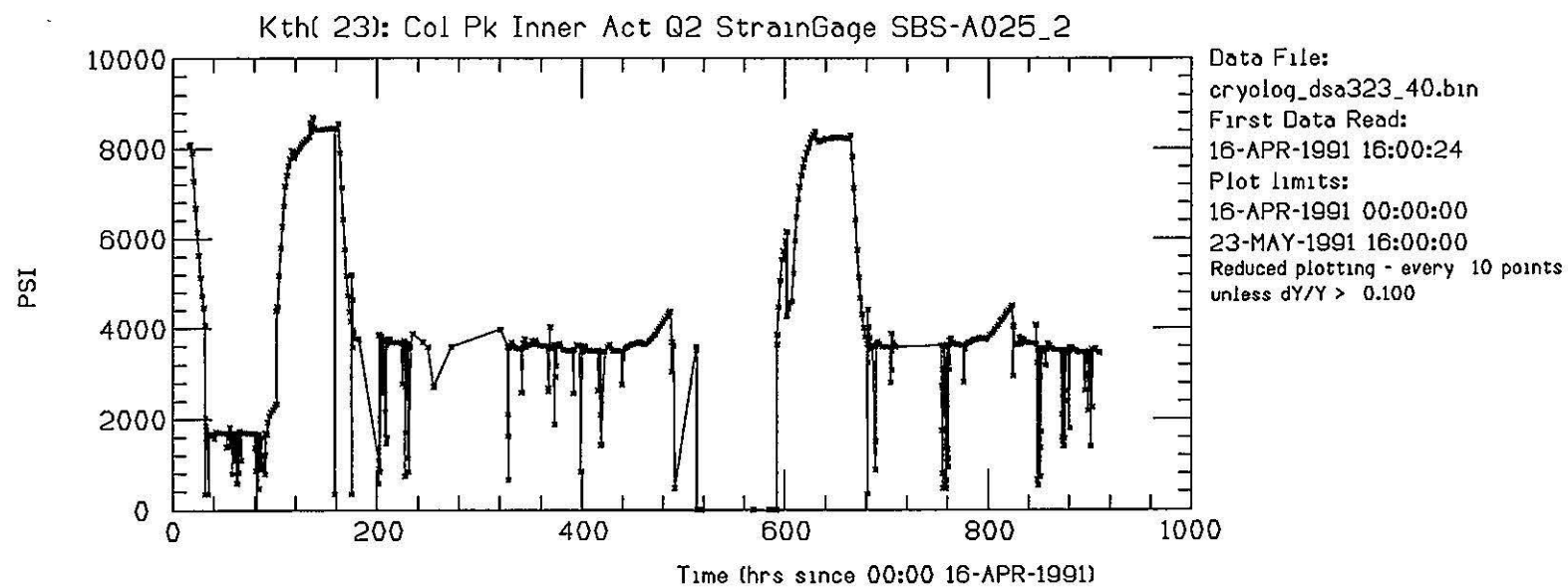
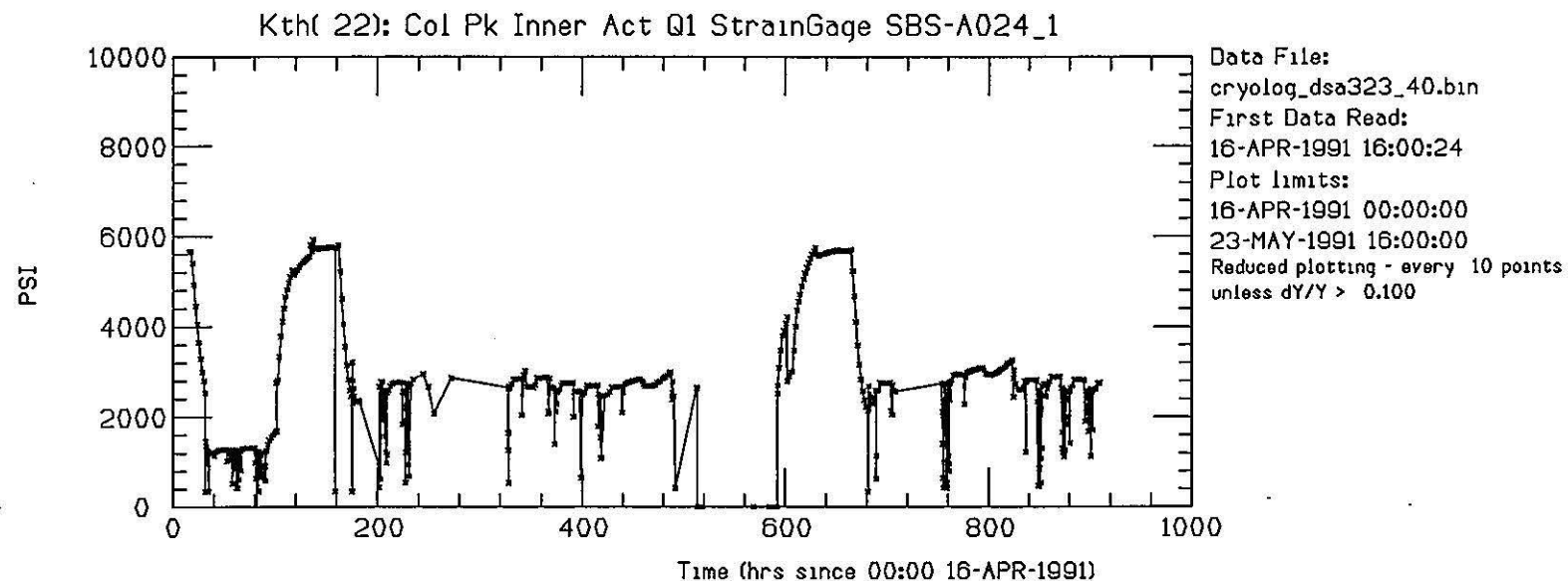
3-JUN-91 16:26:59



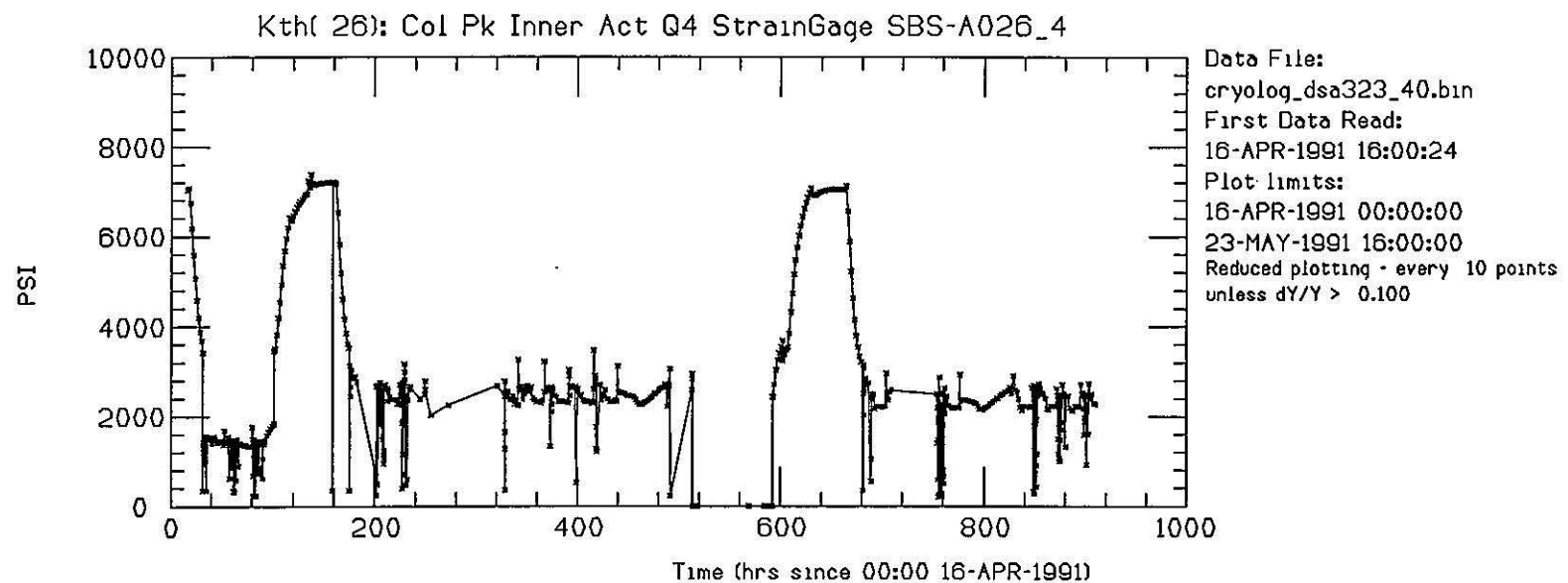
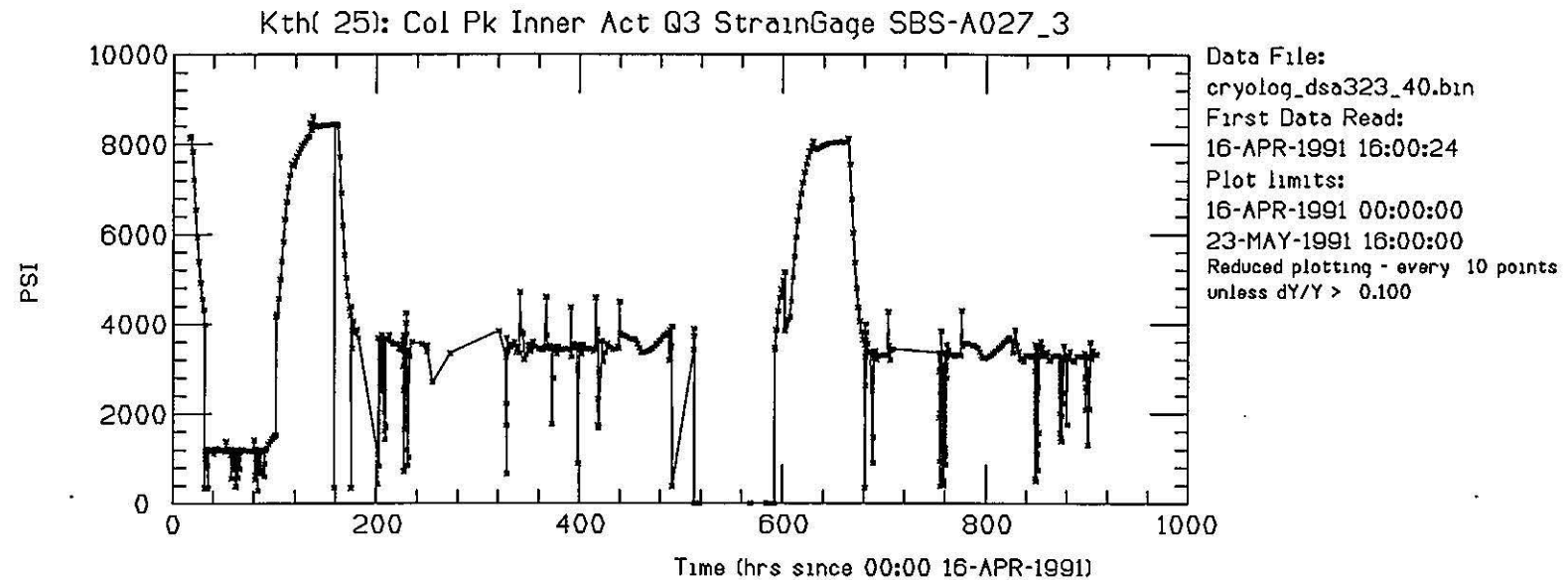
3-JUN-91 17:17:02



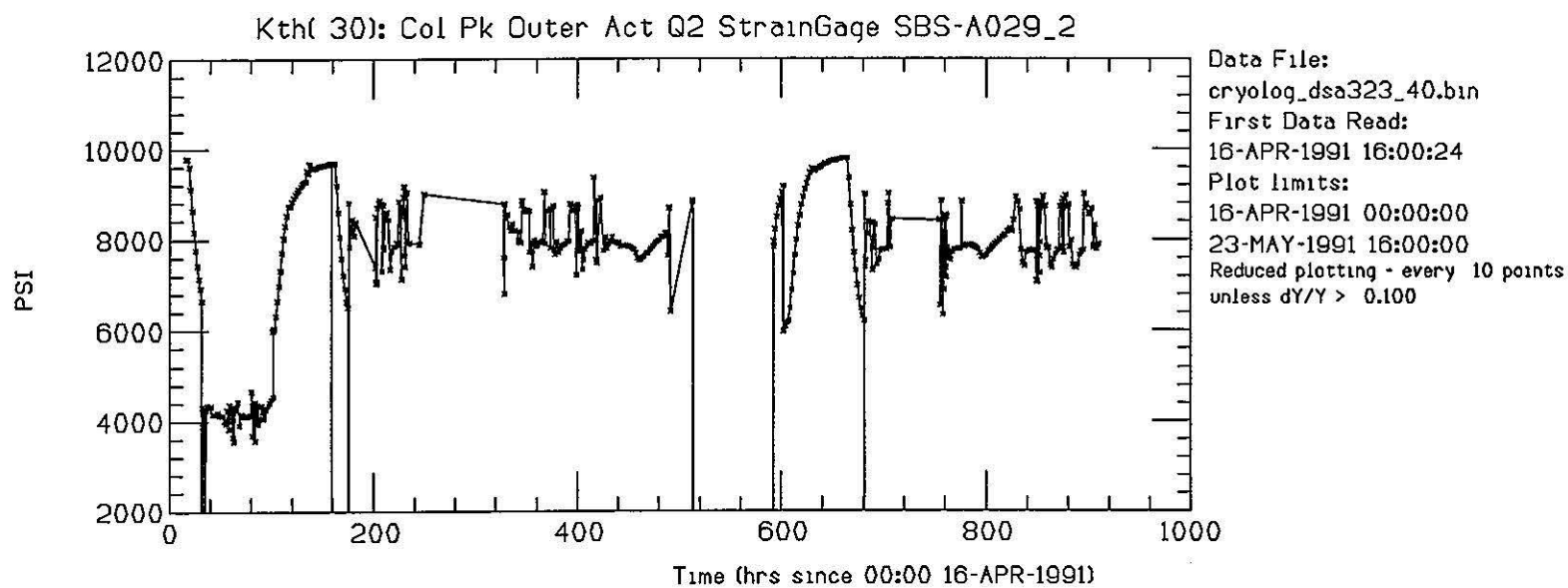
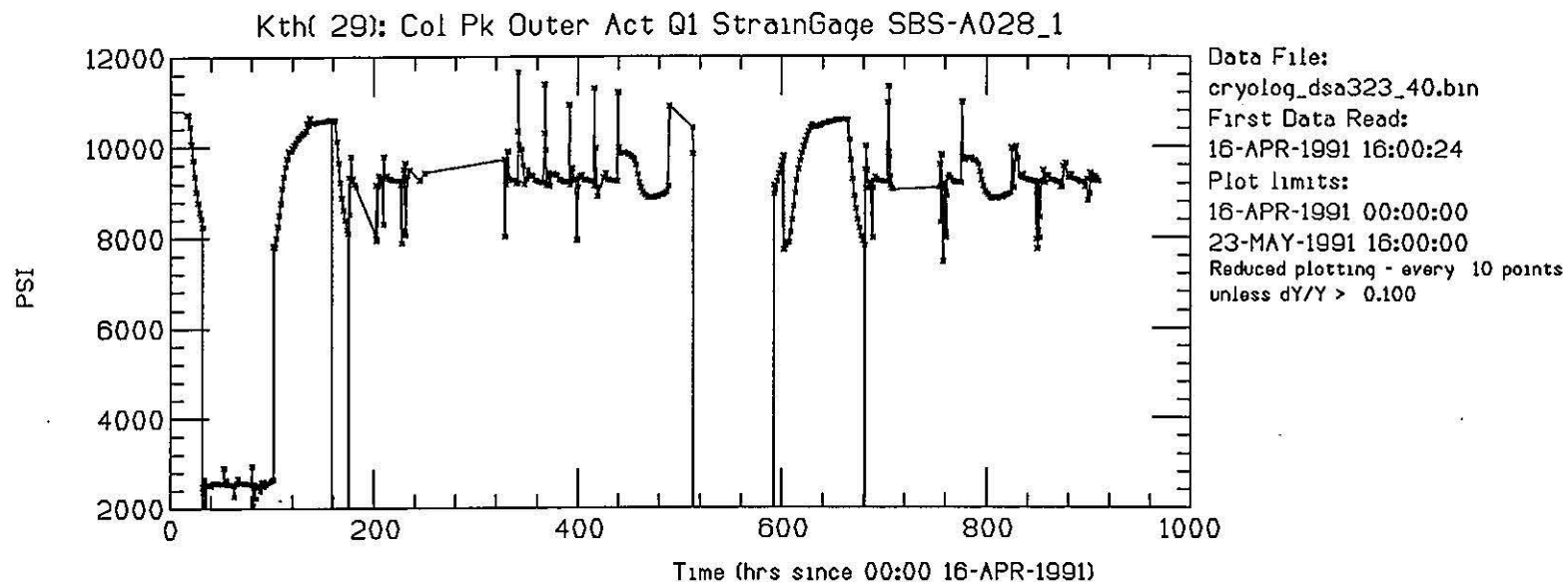
3-JUN-91 17:18:51



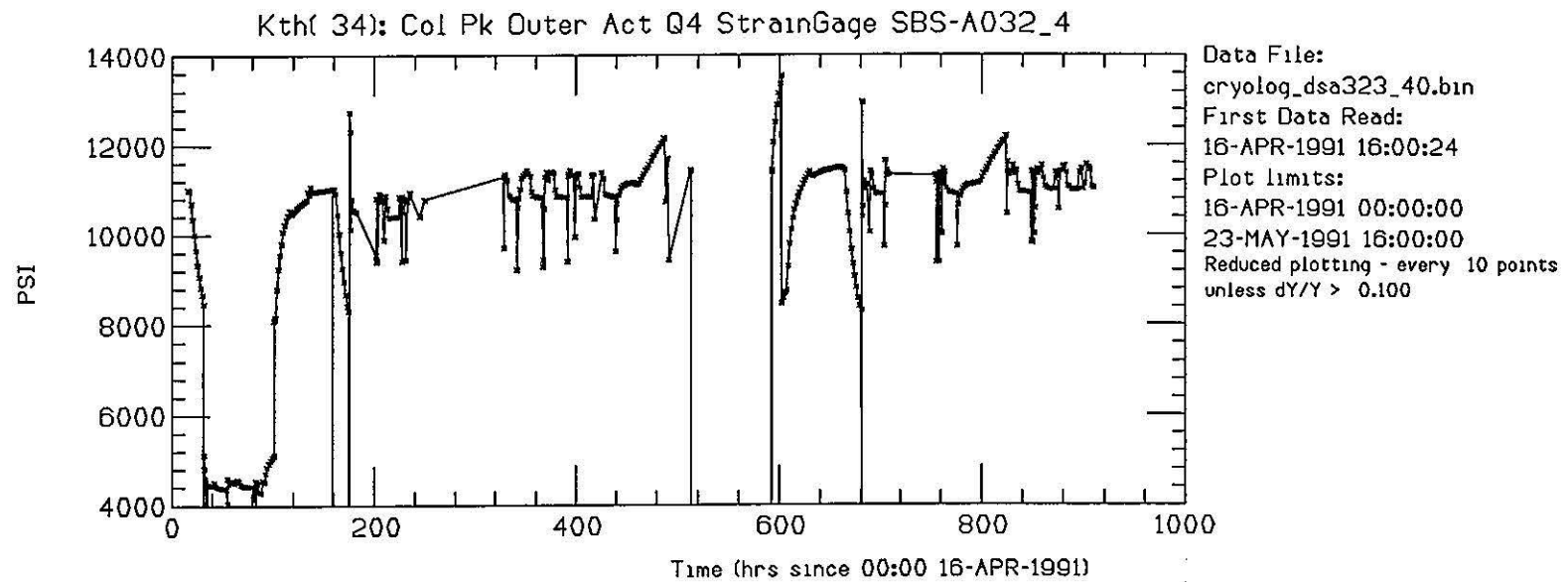
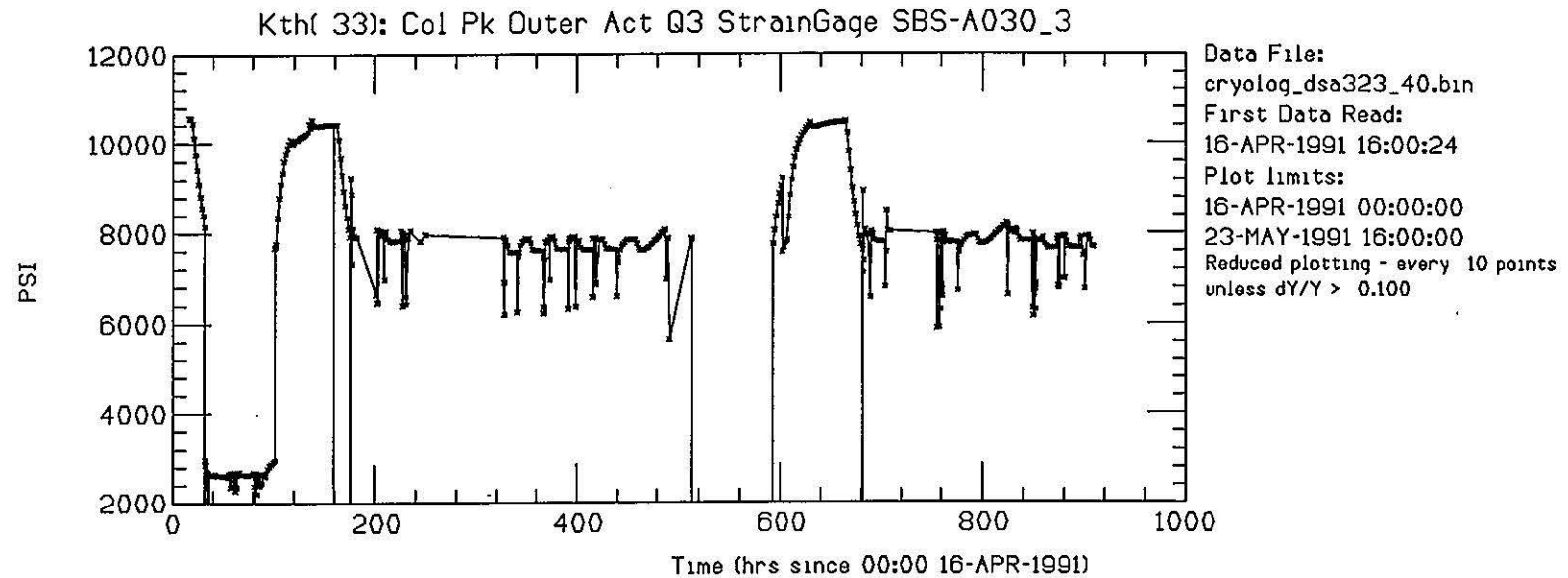
3-JUN-91 17:20:04



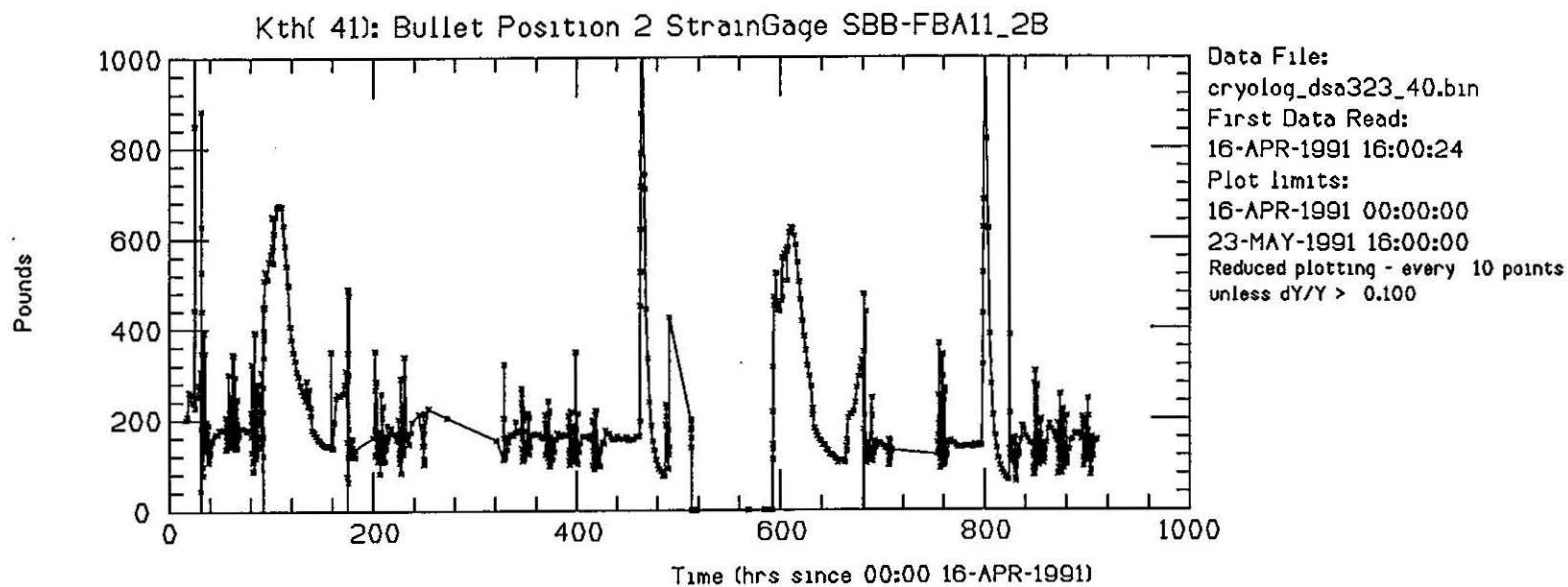
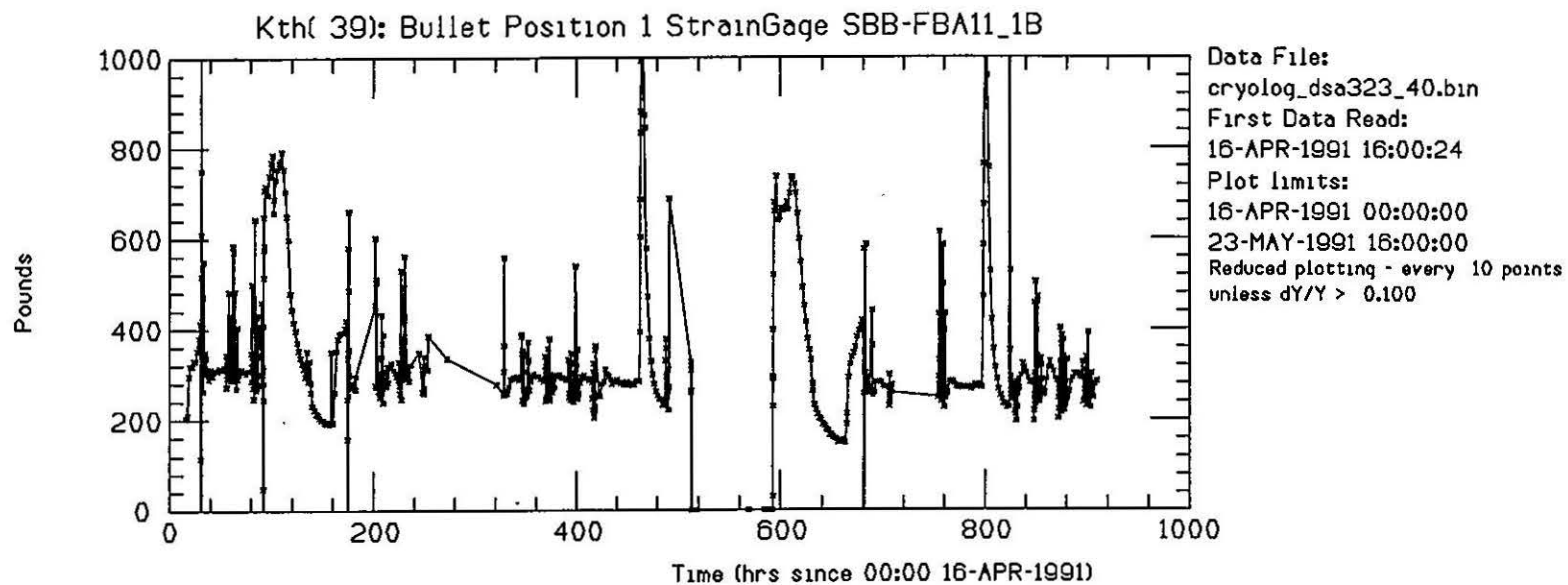
3-JUN-91 17:20:42



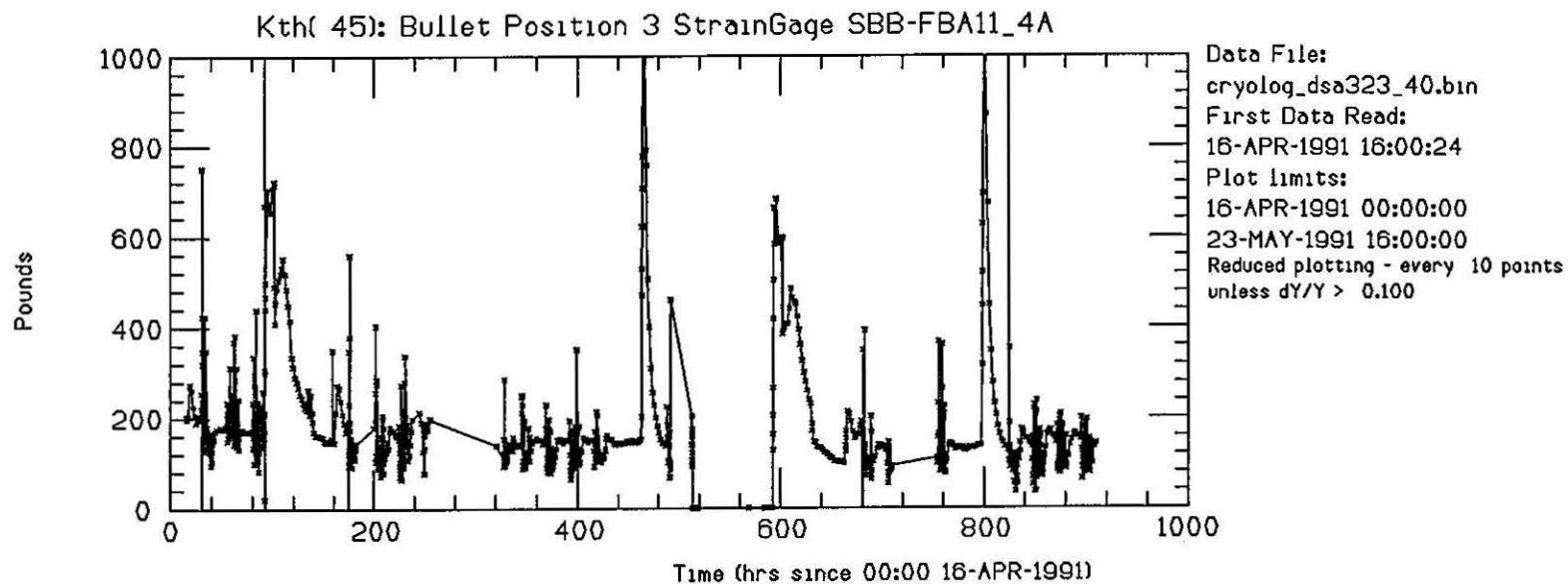
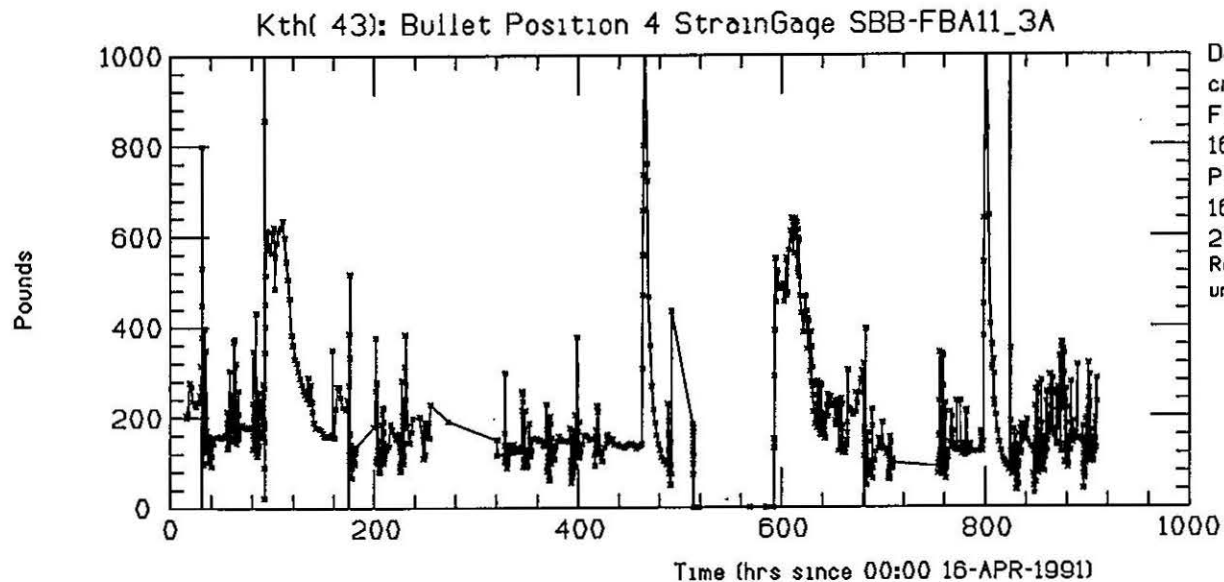
3-JUN-91 17:21:35



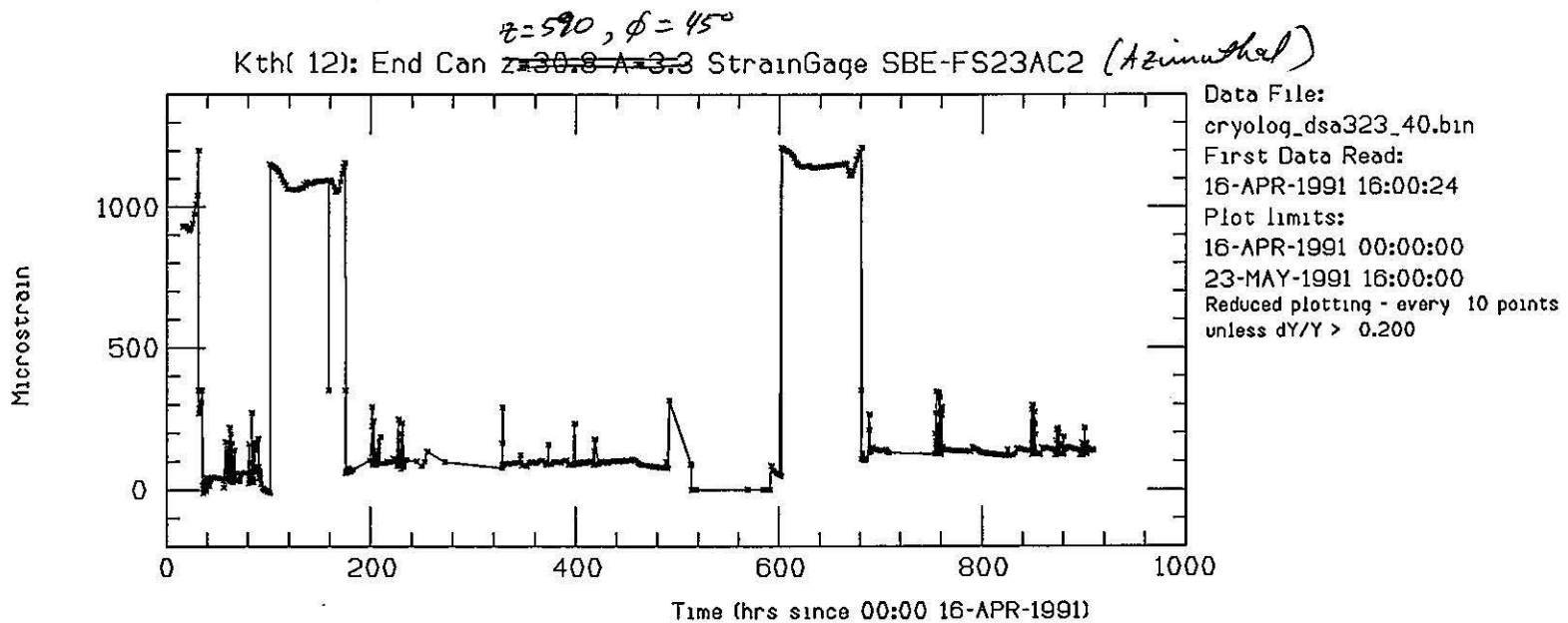
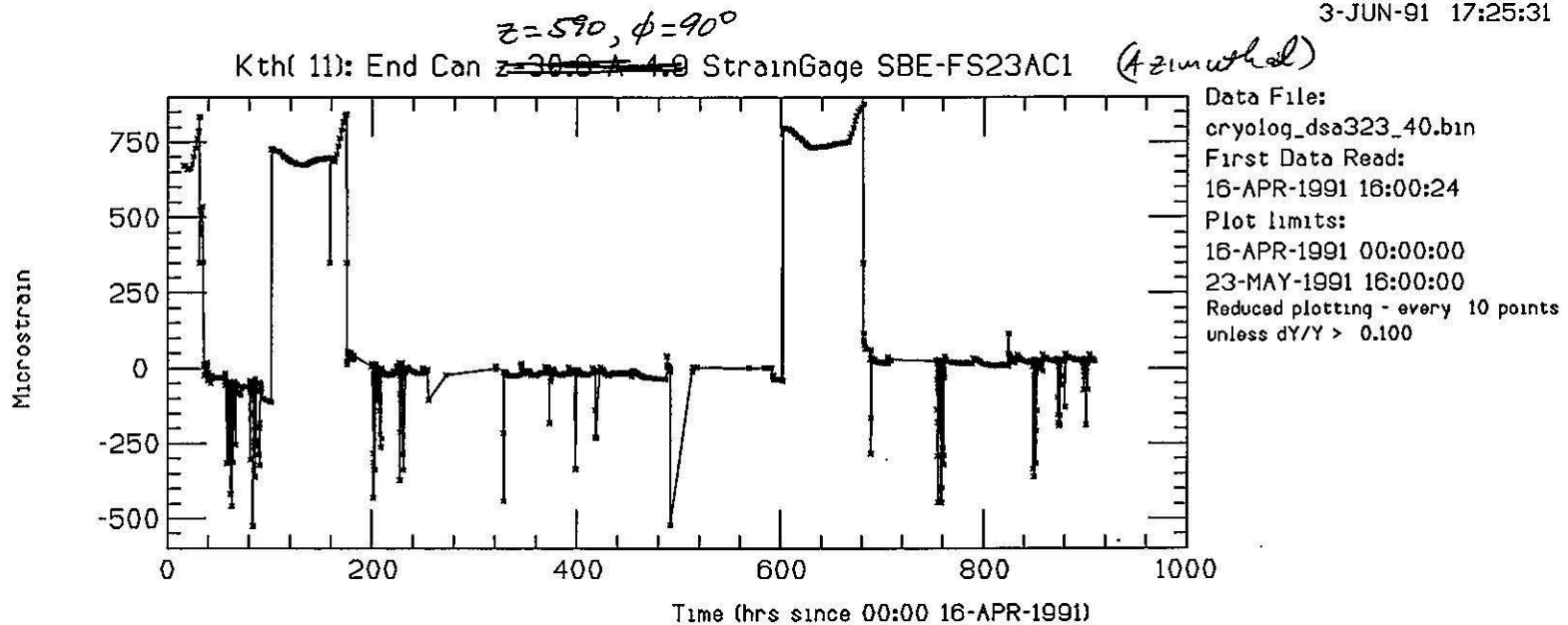
3-JUN-91 17:22:32



3-JUN-91 17:23:32



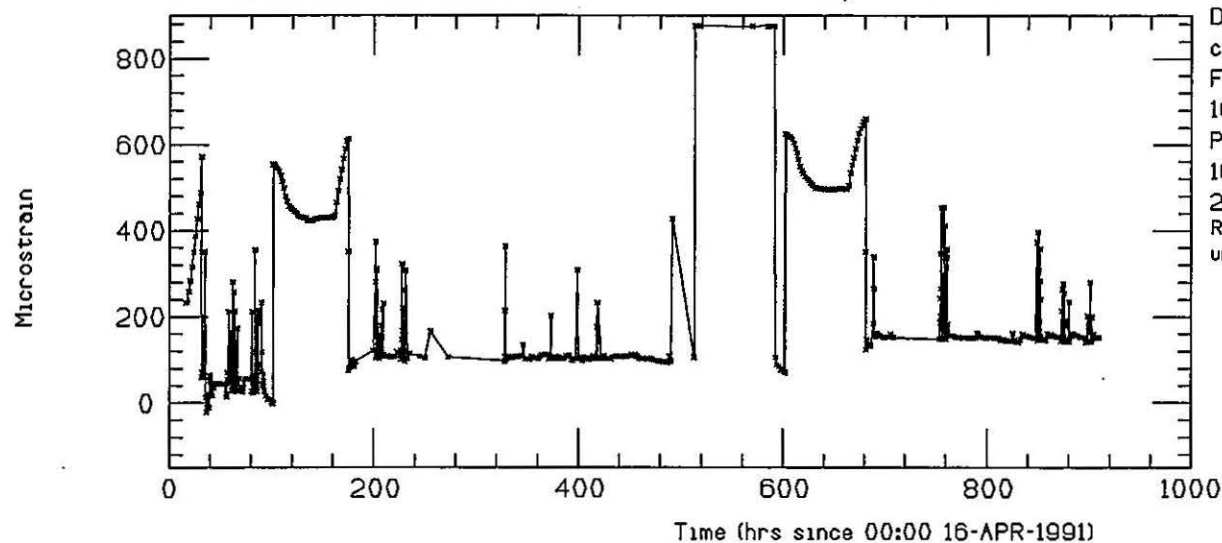
3-JUN-91 17:25:31



3-JUN-91 17:28:28

$z=590, \phi=0$

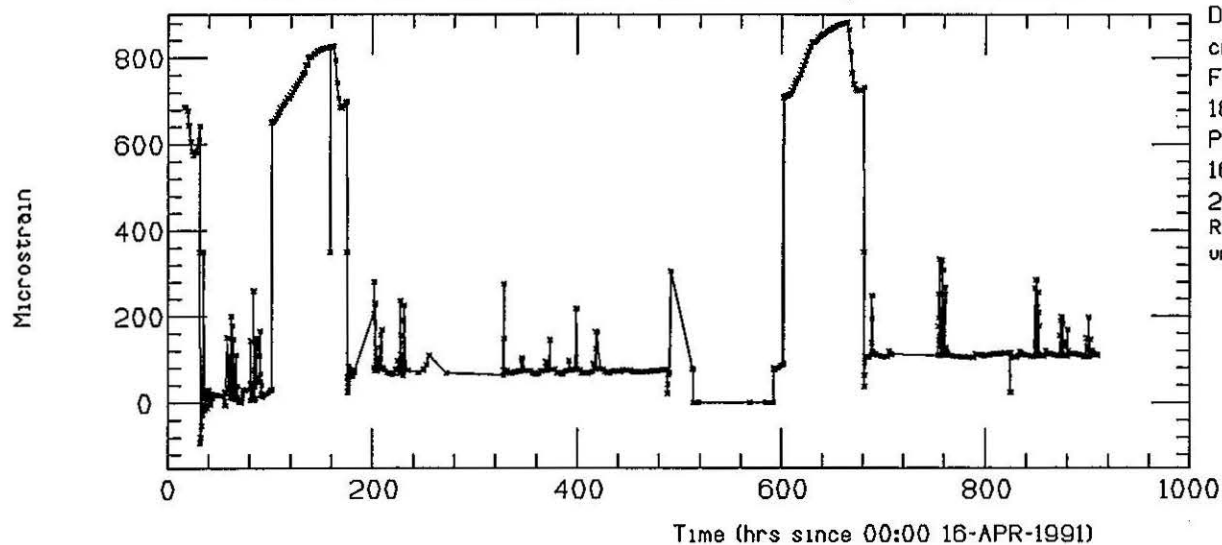
Kth(13): End Can ~~$z=30.8, A=1.6$~~ StrainGage SBE-FS23AC3 (Azimuthal)



Data File:
cryolog_dsa323_40.bin
First Data Read:
16-APR-1991 16:00:24
Plot limits:
16-APR-1991 00:00:00
23-MAY-1991 16:00:00
Reduced plotting - every 10 points
unless $dY/Y > 0.200$

$z=590, \phi=-45^\circ$

Kth(14): End Can ~~$z=30.8, A=0.0$~~ StrainGage SBE-FS23AC4 (Azimuthal)

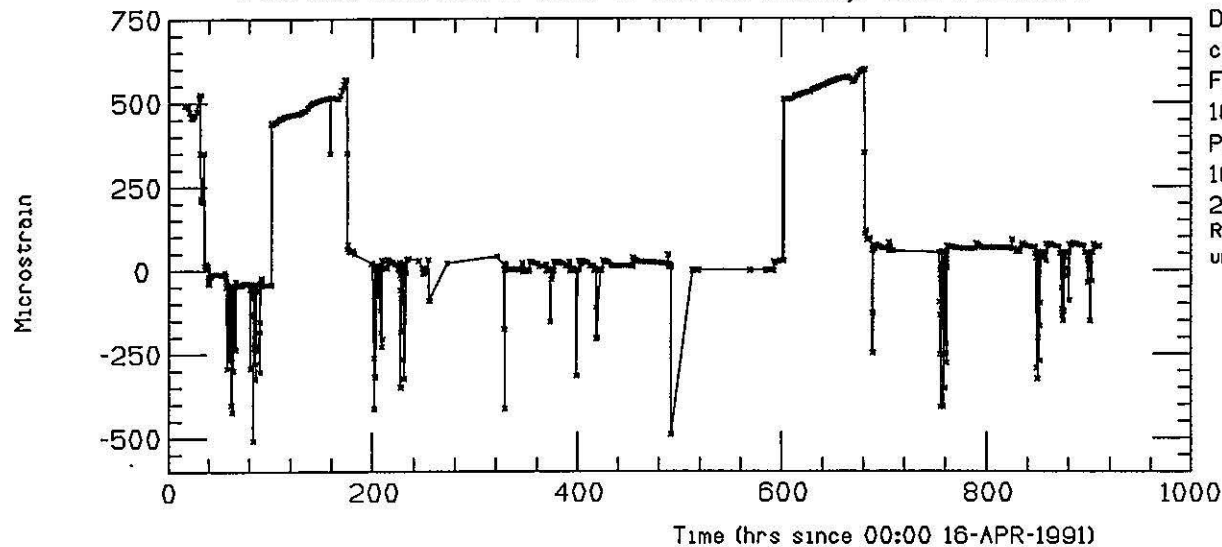


Data File:
cryolog_dsa323_40.bin
First Data Read:
16-APR-1991 16:00:24
Plot limits:
16-APR-1991 00:00:00
23-MAY-1991 16:00:00
Reduced plotting - every 10 points
unless $dY/Y > 0.200$

$z=590, \phi = -90^\circ$

3-JUN-91 17:29:07

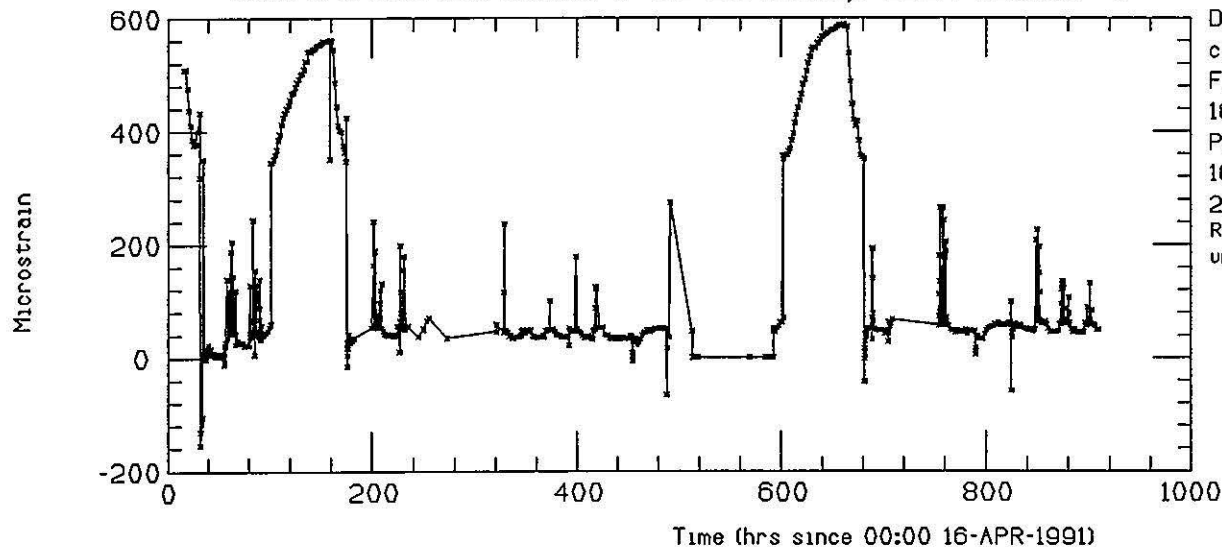
Kth(15): End Can ~~z=30.8 A=3.3~~ StrainGage SBE-FS23AC5 (Azimuthal)



Data File:
cryolog_dsa323_40.bin
First Data Read:
16-APR-1991 16:00:24
Plot limits:
16-APR-1991 00:00:00
23-MAY-1991 16:00:00
Reduced plotting - every 10 points
unless $dY/Y > 0.200$

$z=590, \phi = 135^\circ$

Kth(17): End Can ~~z=30.8 A=0.0~~ StrainGage SBE-FS23AC7 (Azimuthal)

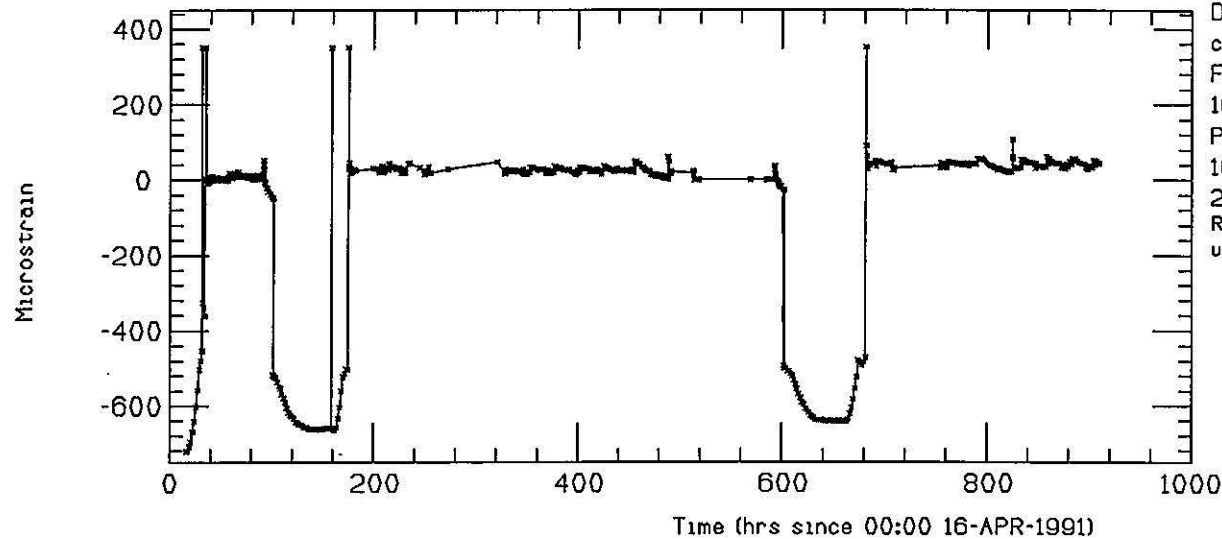


Data File:
cryolog_dsa323_40.bin
First Data Read:
16-APR-1991 16:00:24
Plot limits:
16-APR-1991 00:00:00
23-MAY-1991 16:00:00
Reduced plotting - every 10 points
unless $dY/Y > 0.200$

3-JUN-91 17:29:35

$z=610, \phi=90^\circ$

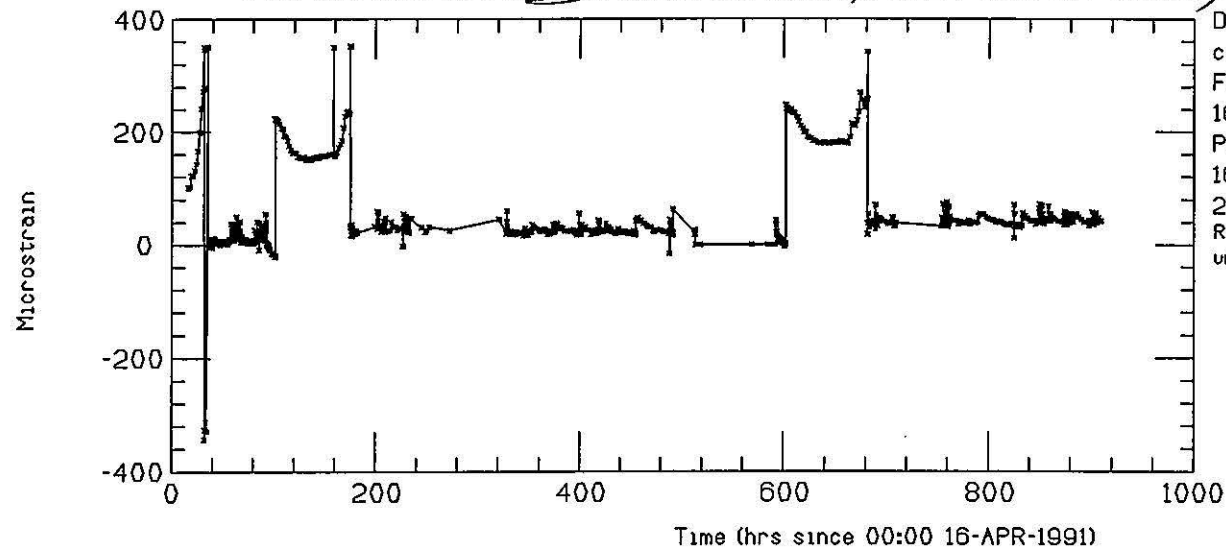
Kth(18): End Can ~~$z=30.8, A=0.0$~~ StrainGage SBE-FS23LC1 (Axial)



Data File:
cryolog_dsa323_40.bin
First Data Read:
16-APR-1991 16:00:24
Plot limits:
16-APR-1991 00:00:00
23-MAY-1991 16:00:00
Reduced plotting - every 10 points
unless $dY/Y > 0.200$

$z=610, \phi=95^\circ$

Kth(19): End Can ~~$z=30.8, A=0.0$~~ StrainGage SBE-FS23LC2 (Axial)

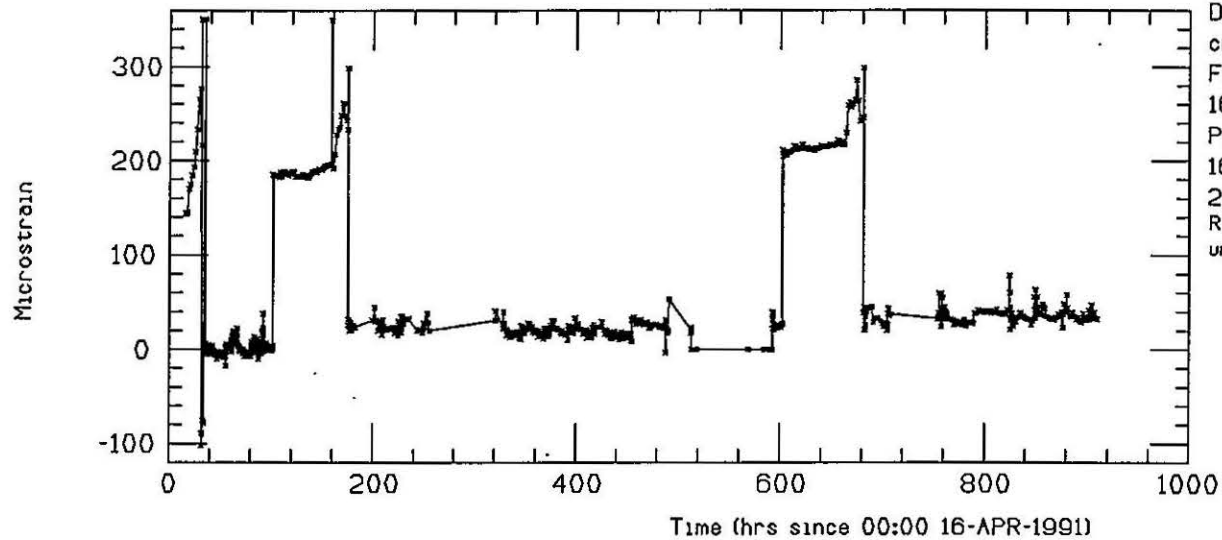


Data File:
cryolog_dsa323_40.bin
First Data Read:
16-APR-1991 16:00:24
Plot limits:
16-APR-1991 00:00:00
23-MAY-1991 16:00:00
Reduced plotting - every 10 points
unless $dY/Y > 0.200$

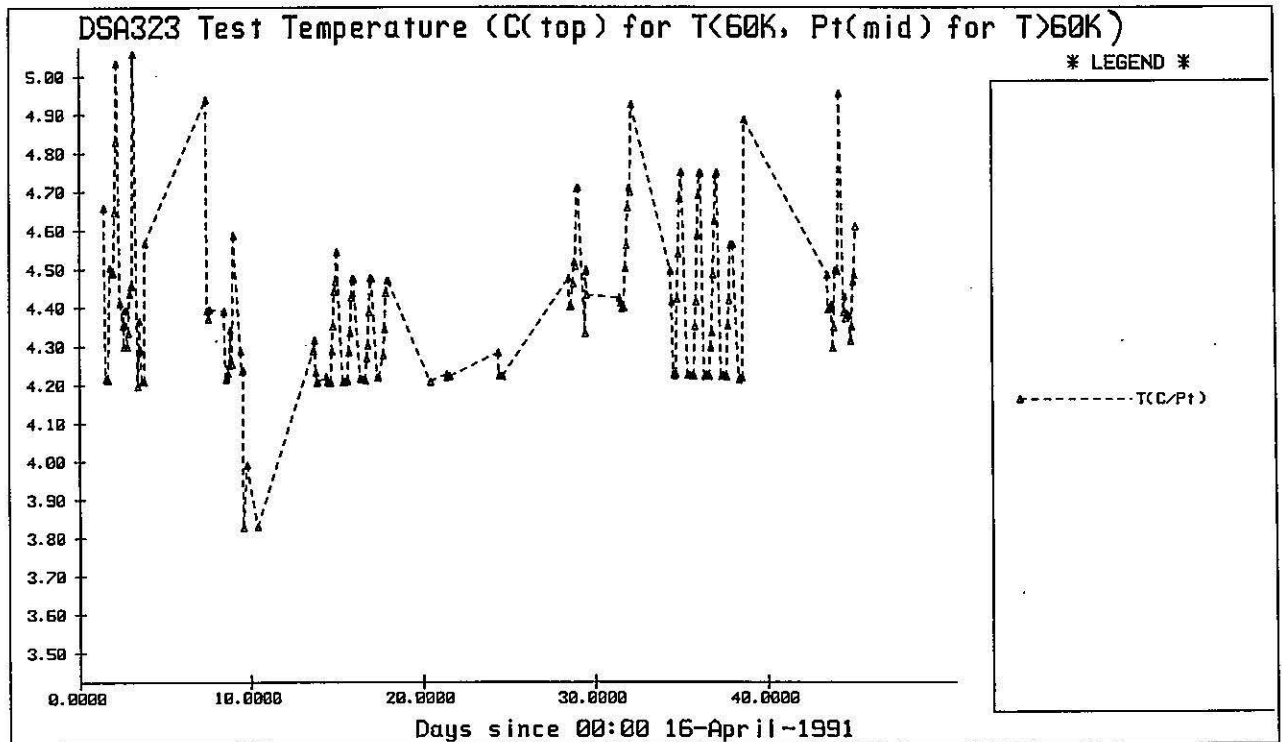
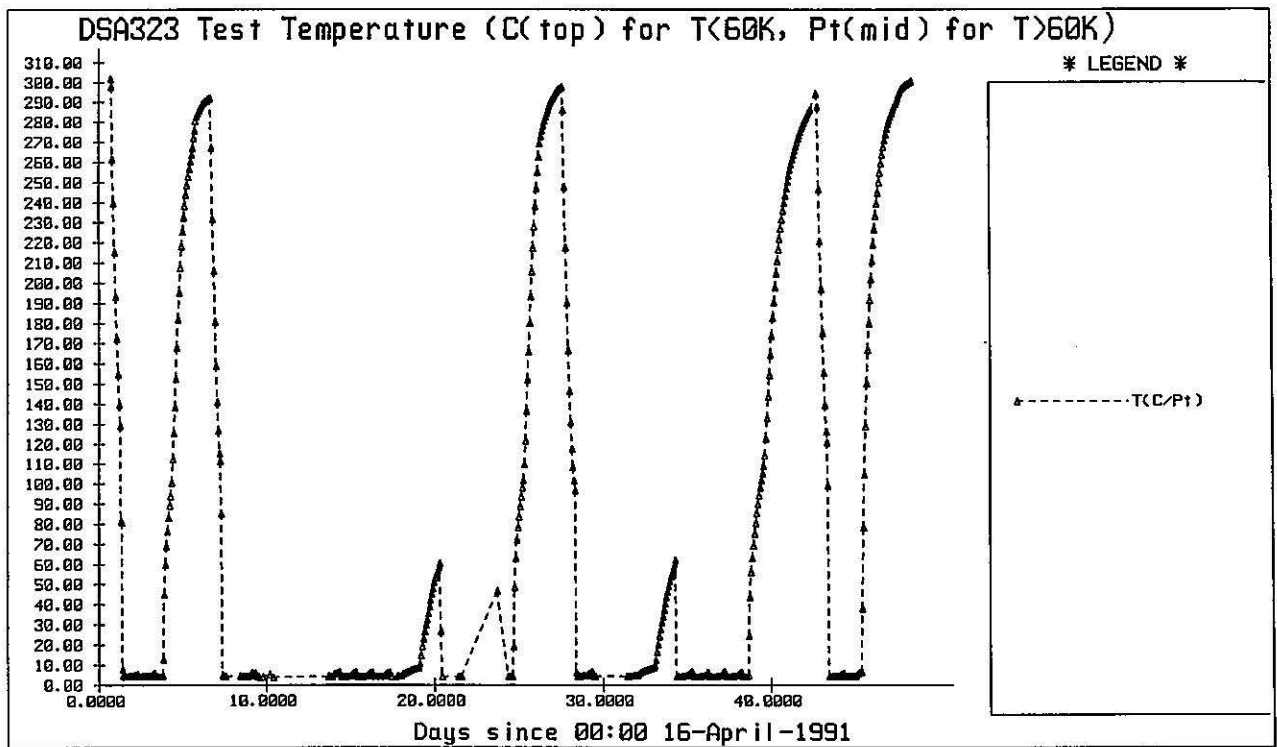
3-JUN-91 17:30:09

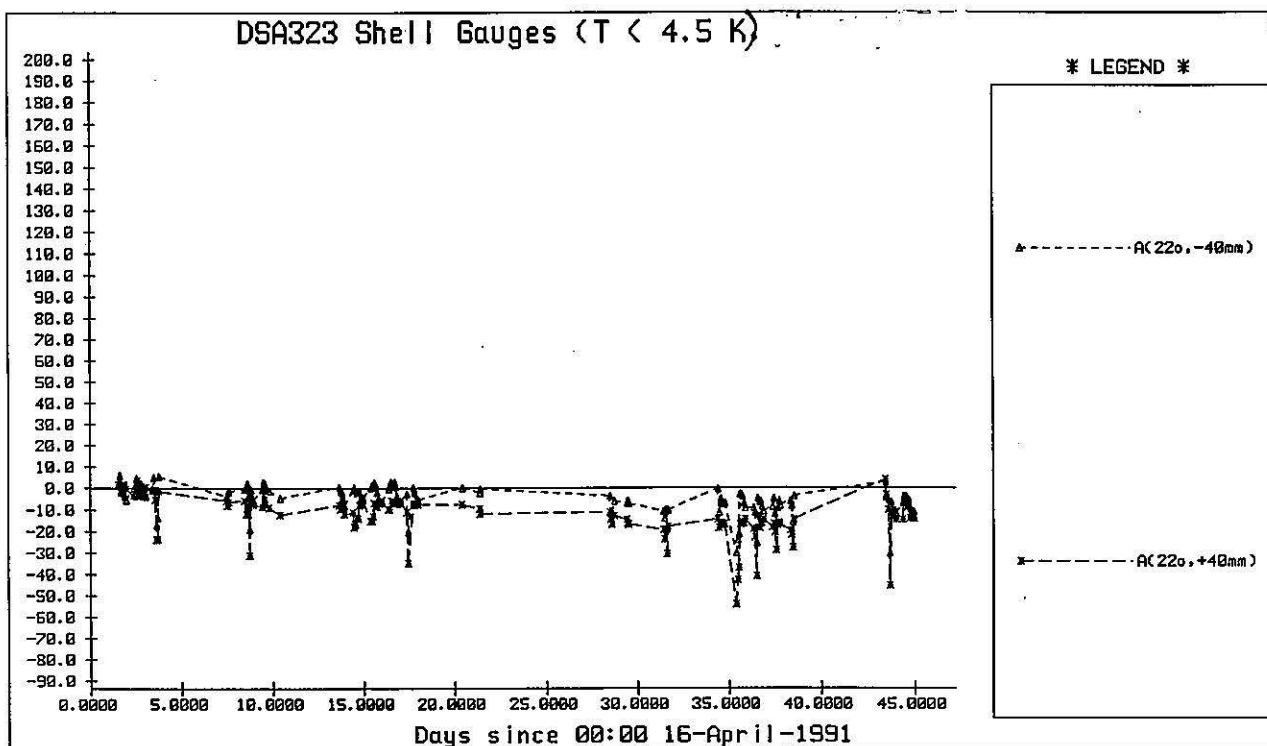
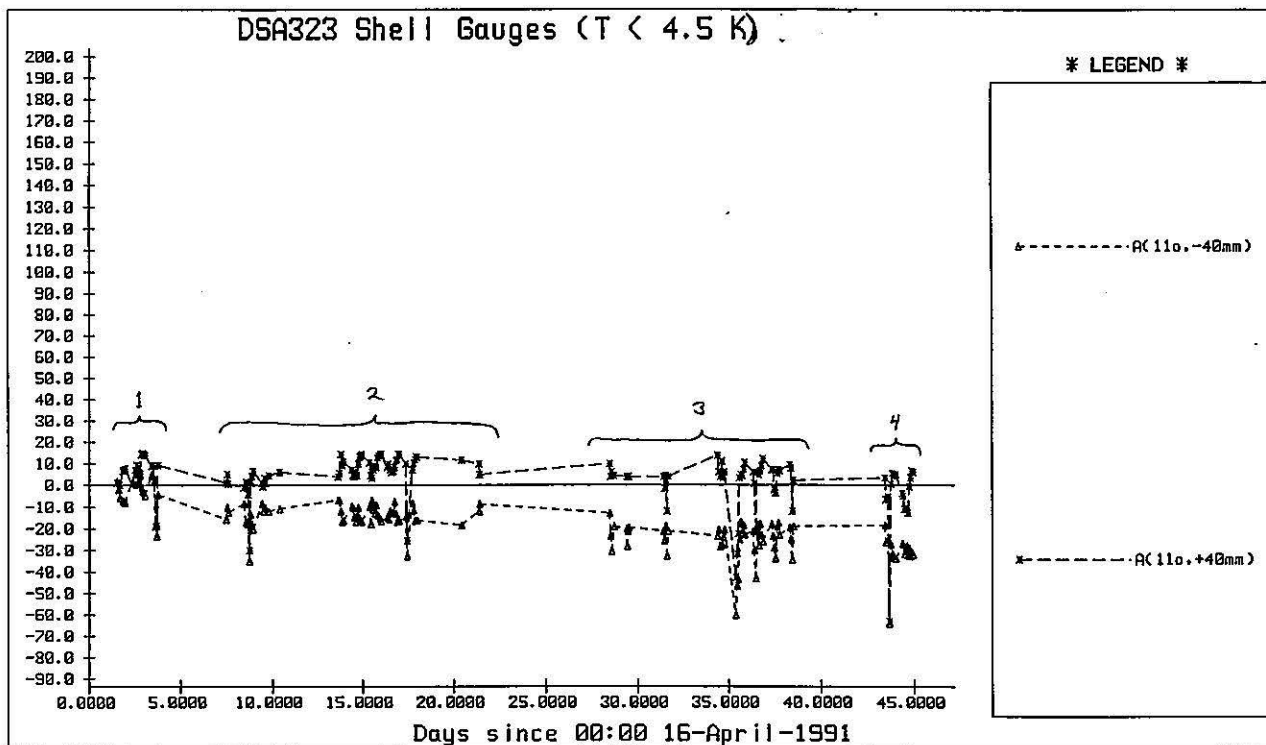
$z=610, \phi=0$

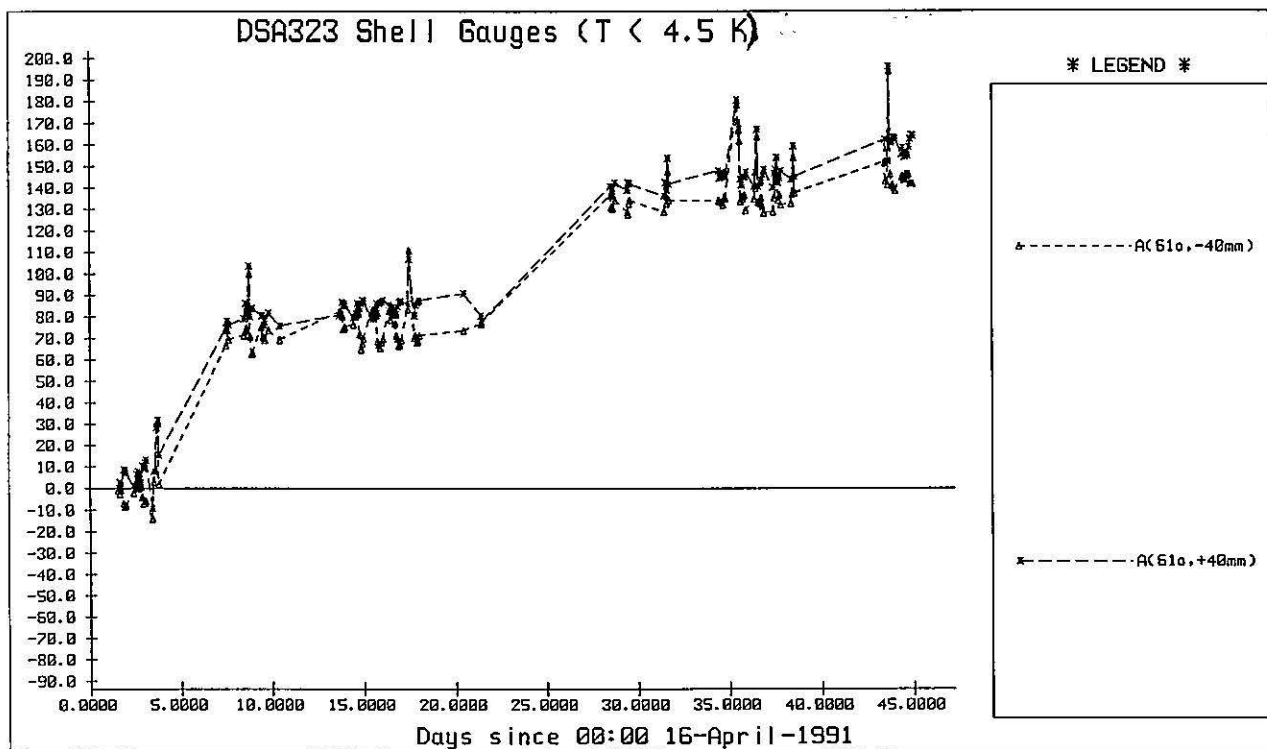
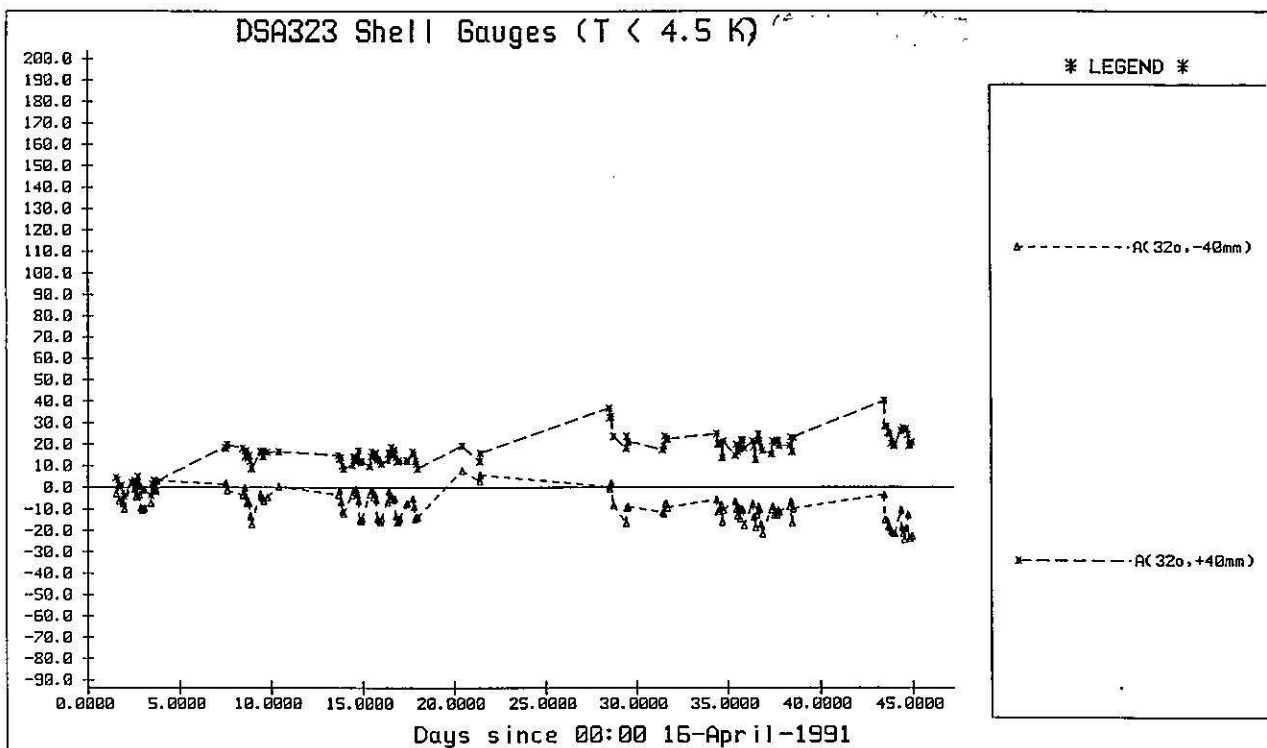
Kth(20): End Can ~~z=30.8 A=0.0~~ StrainGage SBE-FS23LC3 (Axial)

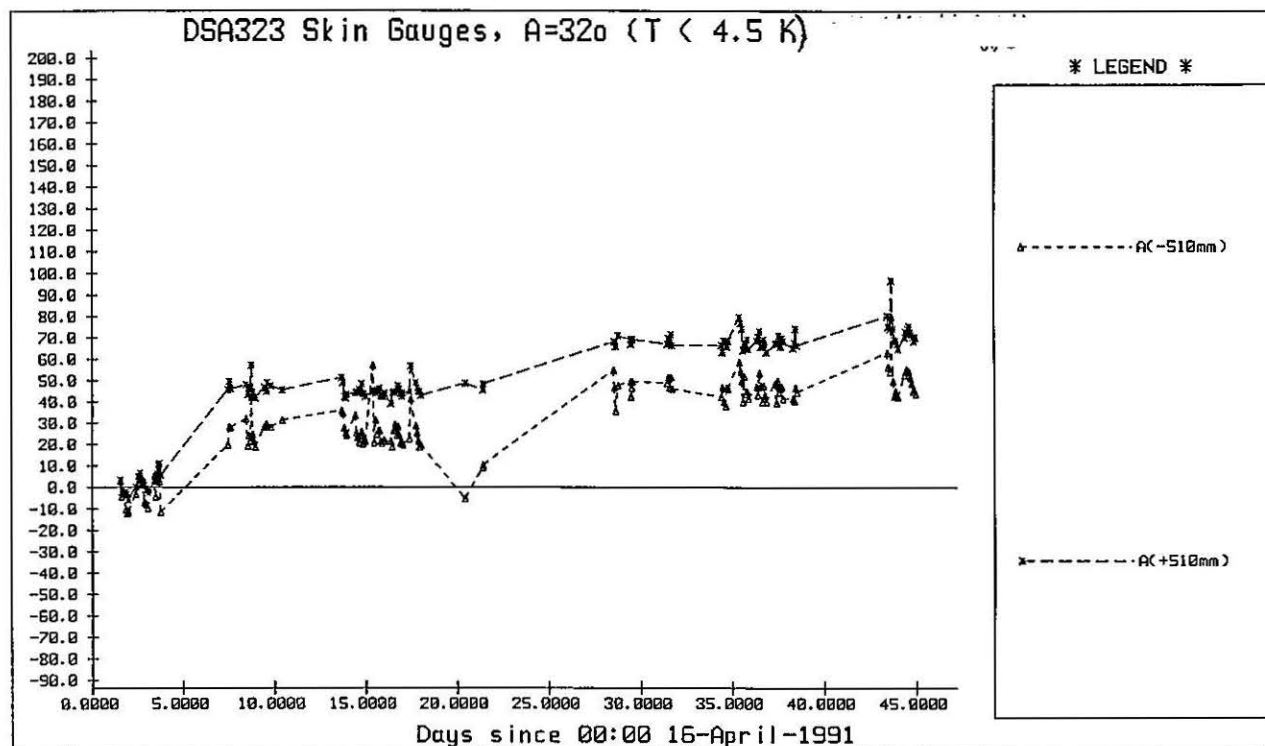
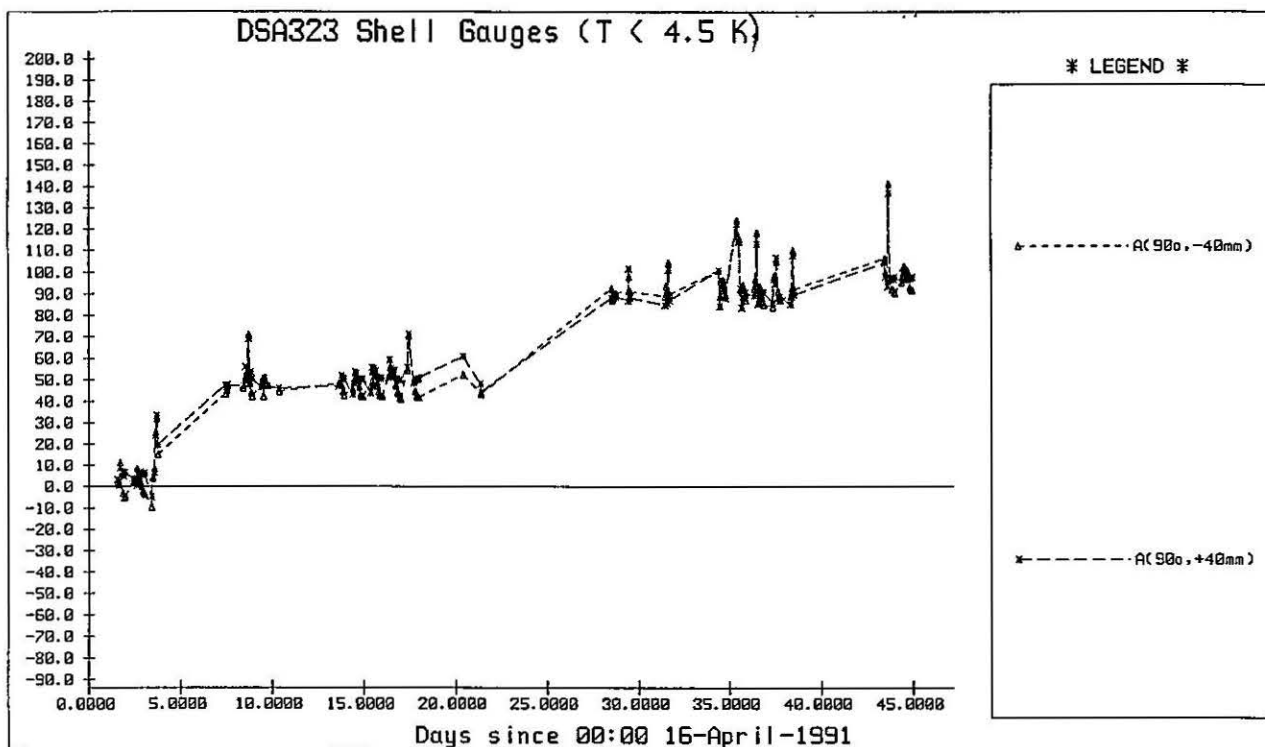


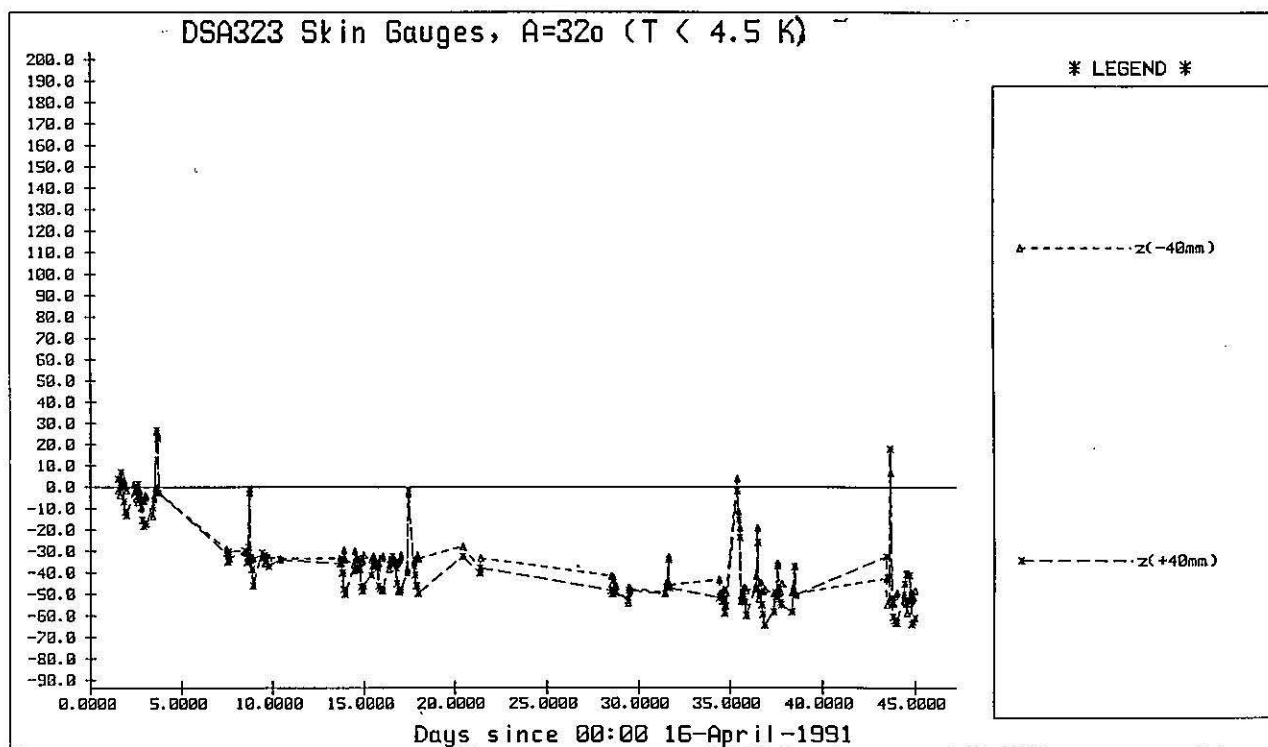
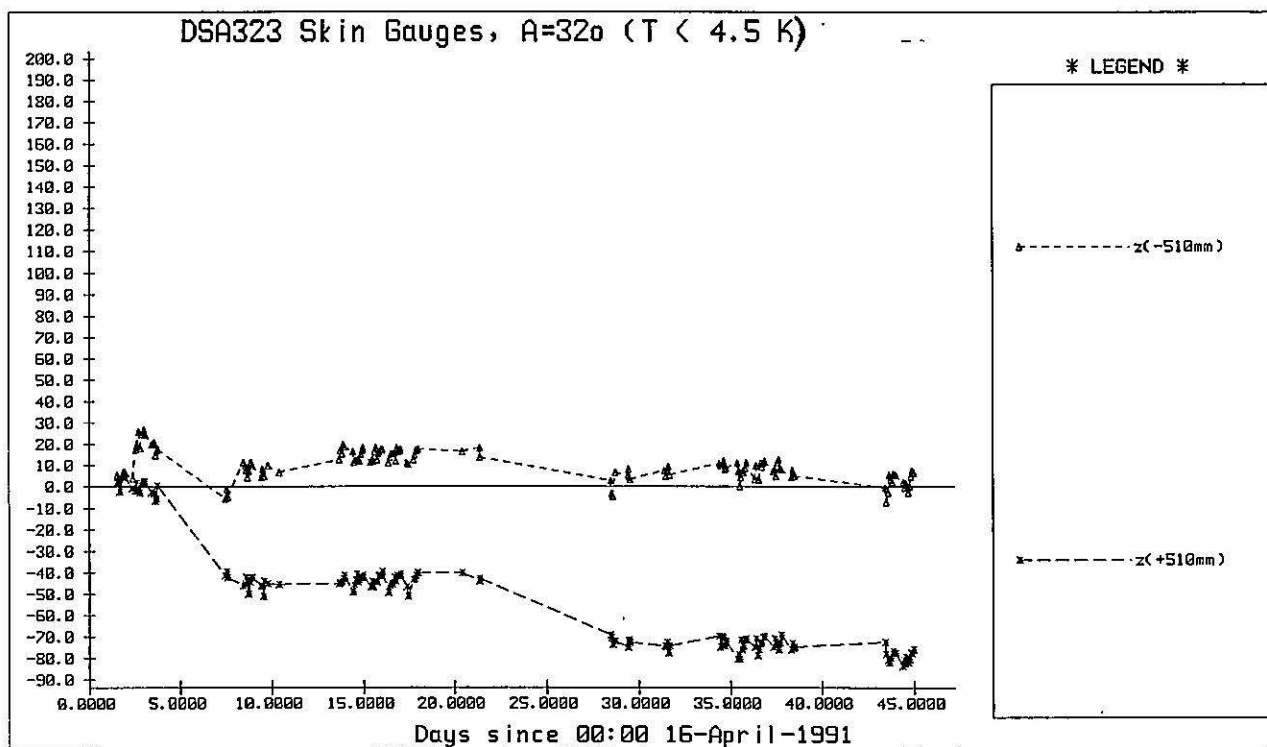
Data File:
cryolog_dsa323_40.bin
First Data Read:
16-APR-1991 16:00:24
Plot limits:
16-APR-1991 00:00:00
23-MAY-1991 16:00:00
Reduced plotting - every 10 points
unless dY/Y > 0.200

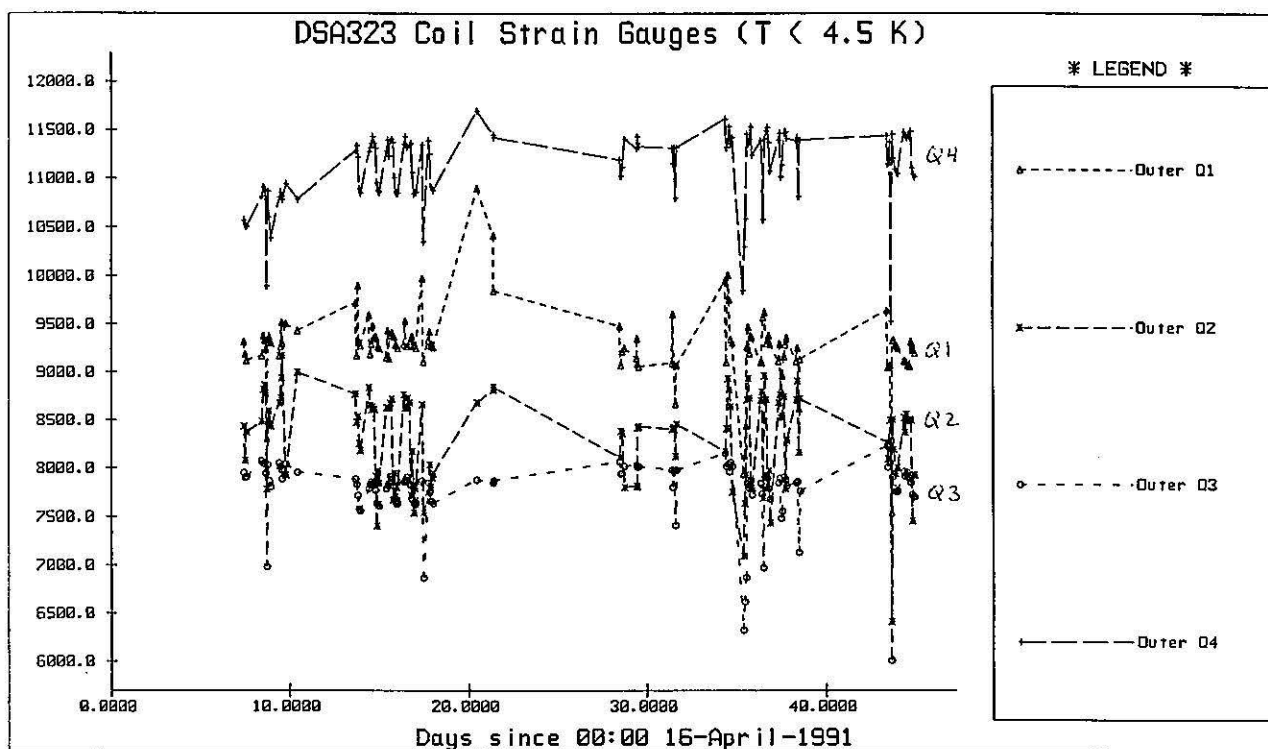
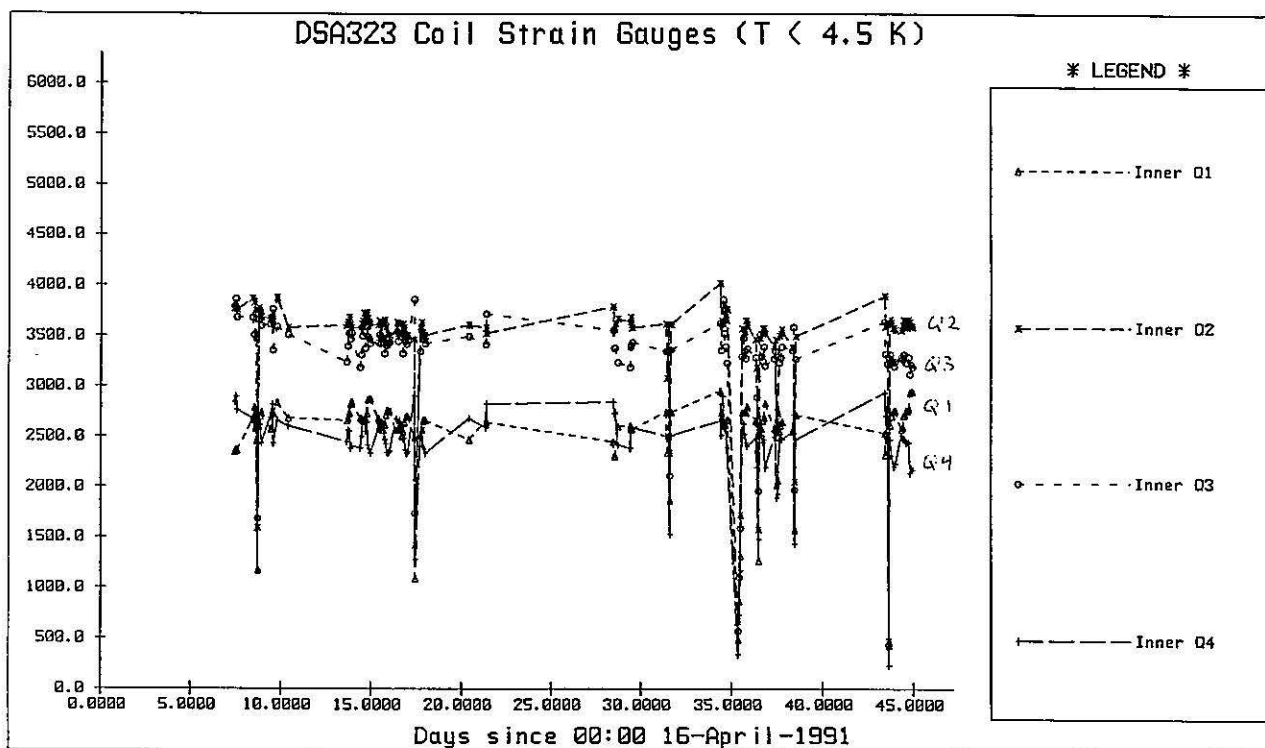












DSA323 Coil Strain Gauges (T < 4.5 K)

