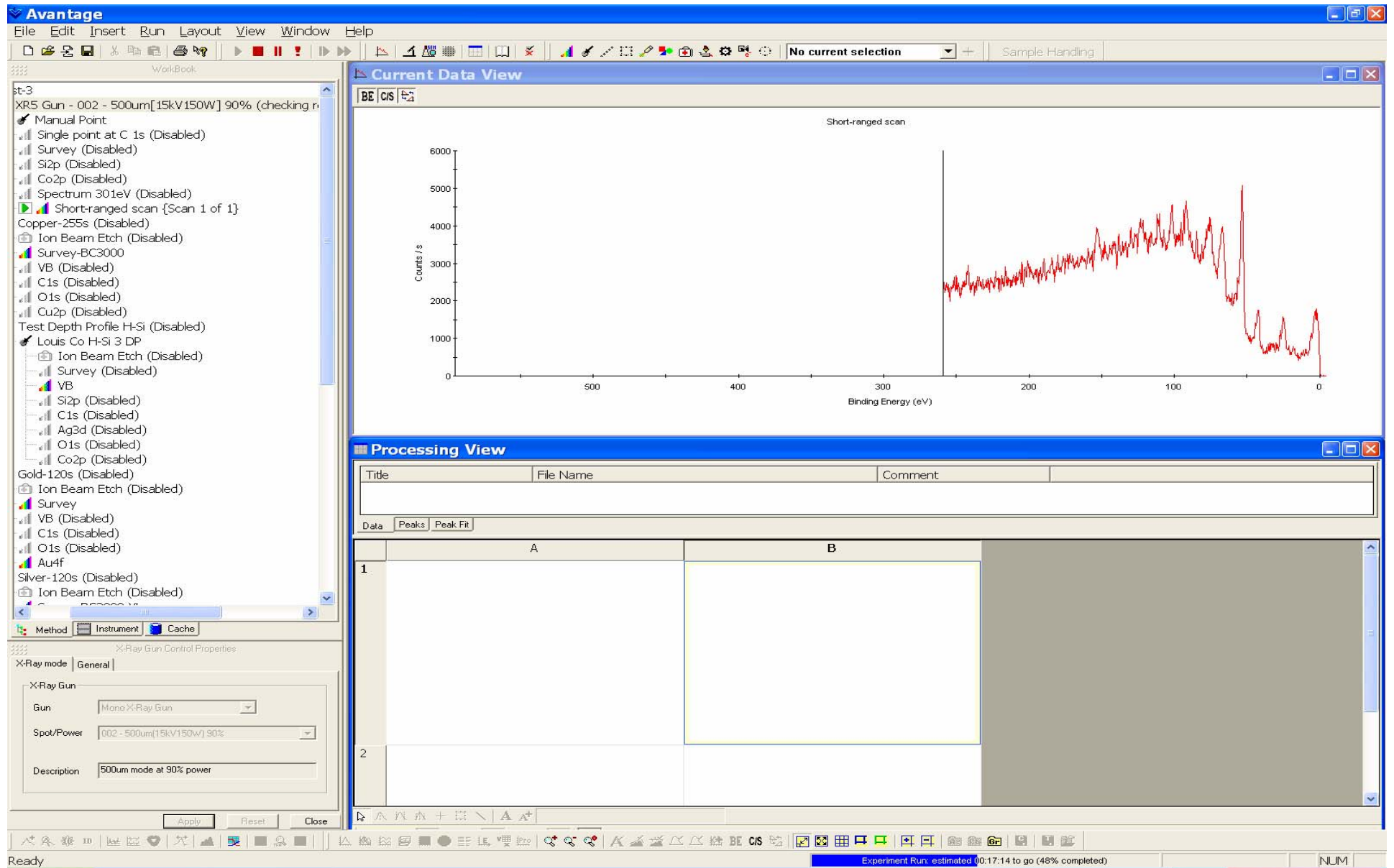


First experiment

Set dwell time = 100 msec - Advantage estimated time 3:20



After 49%, Advantage said ~17 min more to go - this seemed to be the "real" wall-clock time now.

**Avantage**  
 File Edit Insert Run Layout View Window Help

WorkBook

st-3  
 XR5 Gun - 002 - 500um[15kV150W] 90% (checking reac  
 tdown Sequence (Disabled)  
 XR5 Gun - 500um[15kV150W] Shutdown 1  
 ⚙ Wait Object  
 XR5 Gun - 500um[15kV150W] Shutdown 2  
 ⚙ Wait Object  
 XR5 Gun - 500um[15kV150W] Shutdown 3  
 ⚙ Wait Object  
 XR5 Gun - 500um[15kV150W] Shutdown 4  
 ⚙ Wait Object  
 XR5 Gun - 500um[15kV150W] Shutdown 5  
 ⚙ Wait Object  
 XR5 Gun - Shutdown with water on  
 ⚙ Wait Object  
 Gun Shutdown  
 xt Day Restart Sequence (Disabled)  
 Wait Object  
 ⚠ XR5 Gun - 001 - Standby Mode - 500um[10kV60V  
 ⚙ Wait Object  
 ⚠ XR5 Gun - 002 - 500um[15kV150W] 90%  
 ⚙ Wait Object

Method Instrument Cache

X-Ray Gun Control Properties  
 X-Ray mode General  
 Name XR5 Gun - 002 - 500um[15kV150W] 90%  
 Description X-Ray gun control object  
 Estimated Duration 00:03:36  
 Mode Flags  
 Run Enabled  
 Multiplex

Apply Reset Close

**Current Data View**

BE CIS

Short-ranged scan

Counts / s

Binding Energy (eV)

**Processing View**

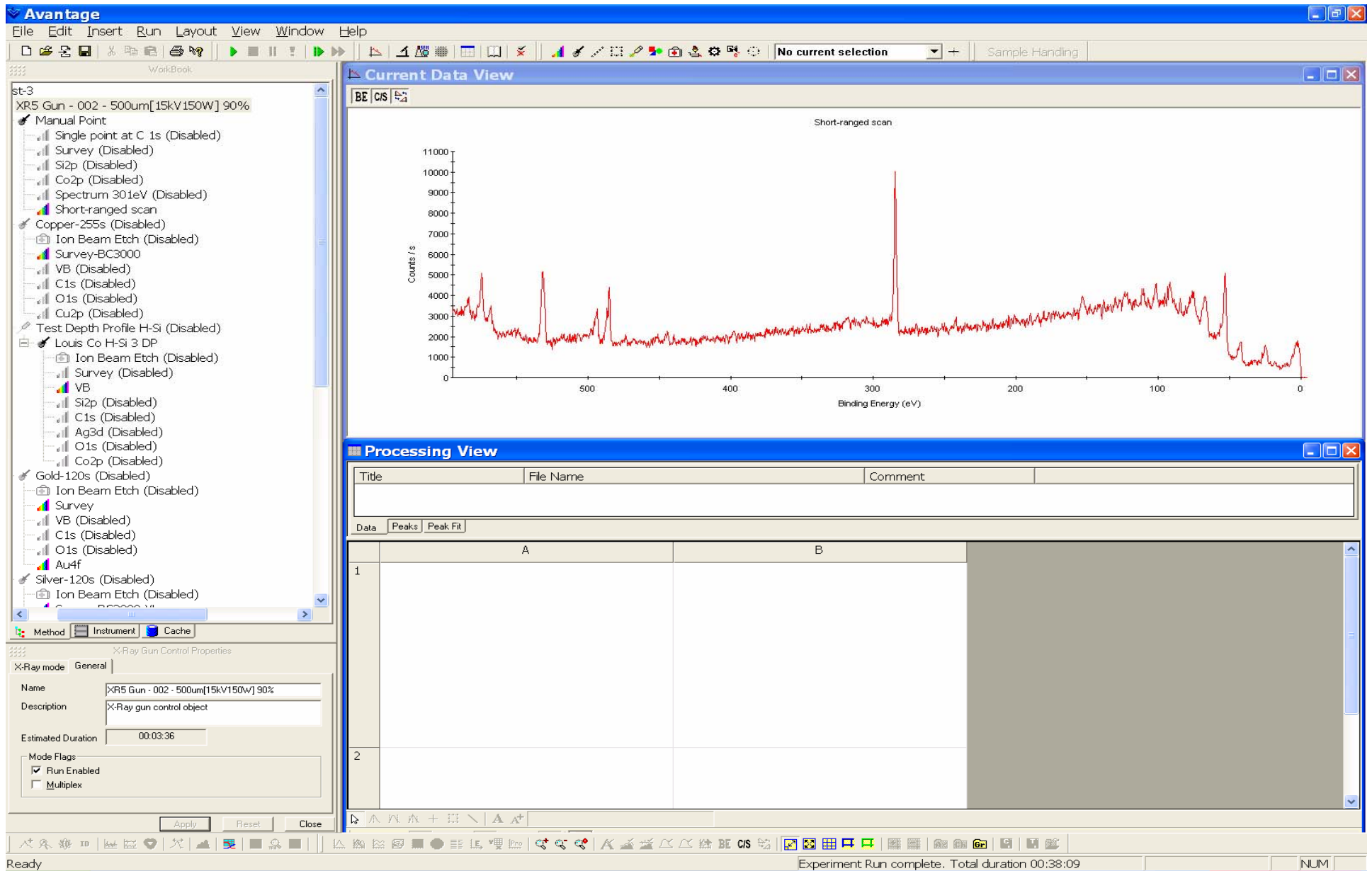
| Title | File Name | Comment |
|-------|-----------|---------|
|       |           |         |

Data Peaks Peak Fit

|   | A | B |
|---|---|---|
| 1 |   |   |
| 2 |   |   |

Ready Experiment Run: estimated 00:02:33 to go (93% completed) NUM

Intermediate screen dump after 95% done



First experiment completed

Wall-clock time = 37:46 min - this agrees with Advantage total duration (38 min)

Experiment 2: Set dwell time = 1000 msec  
 Advantage estimated time 33:25 m – before running the experiment

**Avantage** File Edit Insert Run Layout View Window Help

WorkBook

- B
- 5 Gun - 002 - 500um[15kV150W] 90%
- Manual Point
  - Single point at C 1s (Disabled)
  - Survey (Disabled)
  - Si2p (Disabled)
  - Co2p (Disabled)
  - Spectrum 301eV (Disabled)
  - Short-ranged scan 1000 ms {Scan 1 of 1}
  - opper-255s (Disabled)
  - Ion Beam Etch (Disabled)
  - Survey-BC3000
  - VB (Disabled)
  - C1s (Disabled)
  - O1s (Disabled)
  - Cu2p (Disabled)
  - est Depth Profile H-Si (Disabled)
  - Louis Co H-Si 3 DP
    - Ion Beam Etch (Disabled)
    - Survey (Disabled)
    - VB
    - Si2p (Disabled)
    - C1s (Disabled)
    - Ag3d (Disabled)
    - O1s (Disabled)
    - Co2p (Disabled)
  - old-120s (Disabled)
  - Ion Beam Etch (Disabled)
  - Survey
  - VB (Disabled)
  - C1s (Disabled)
  - O1s (Disabled)
  - Au4f
  - ver-120s (Disabled)
  - Ion Beam Etch (Disabled)
  - Survey-BC3000-XL-sp
  - VB (Disabled)

Method Instrument Cache

CEM Scanned Spectrum Control Properties

CEM Scan General

Name: Short-ranged scan 1000 ms  
 Description: Scanned from -5.00 to 595.00 eV binding energy in 0.30 eV steps.  
 Estimated Duration: 00:33:25

Mode Flags  
 Run Enabled  
 Multiplex

Apply Reset Close

**Current Data View**

BE CIS

Short-ranged scan 1000 ms

**Processing View**

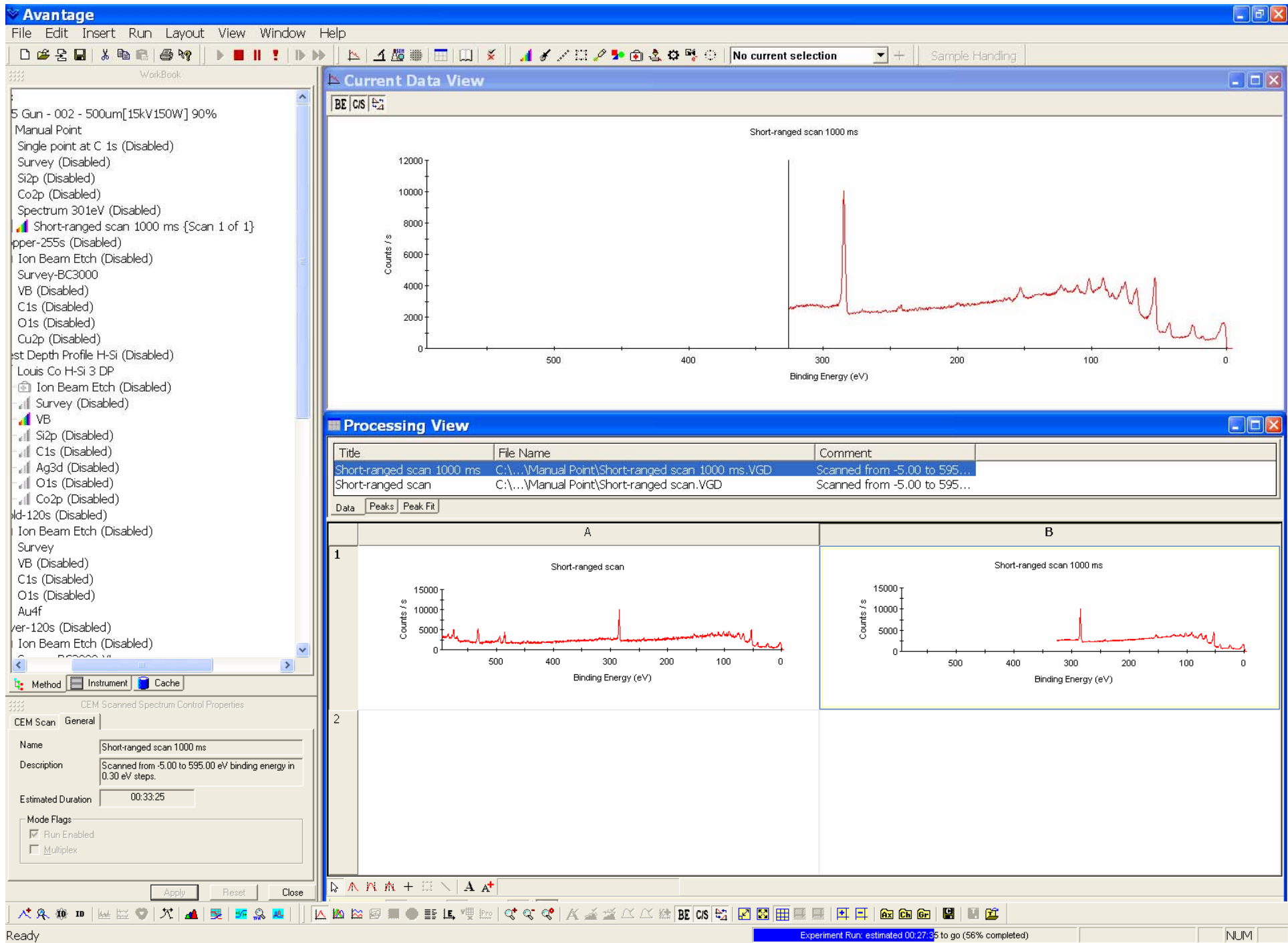
| Title             | File Name                                 | Comment                      |
|-------------------|---|------------------------------|
| Short-ranged scan | C:\...\Manual Point\Short-ranged scan.VGD | Scanned from -5.00 to 595... |

Data Peaks Peak Fit

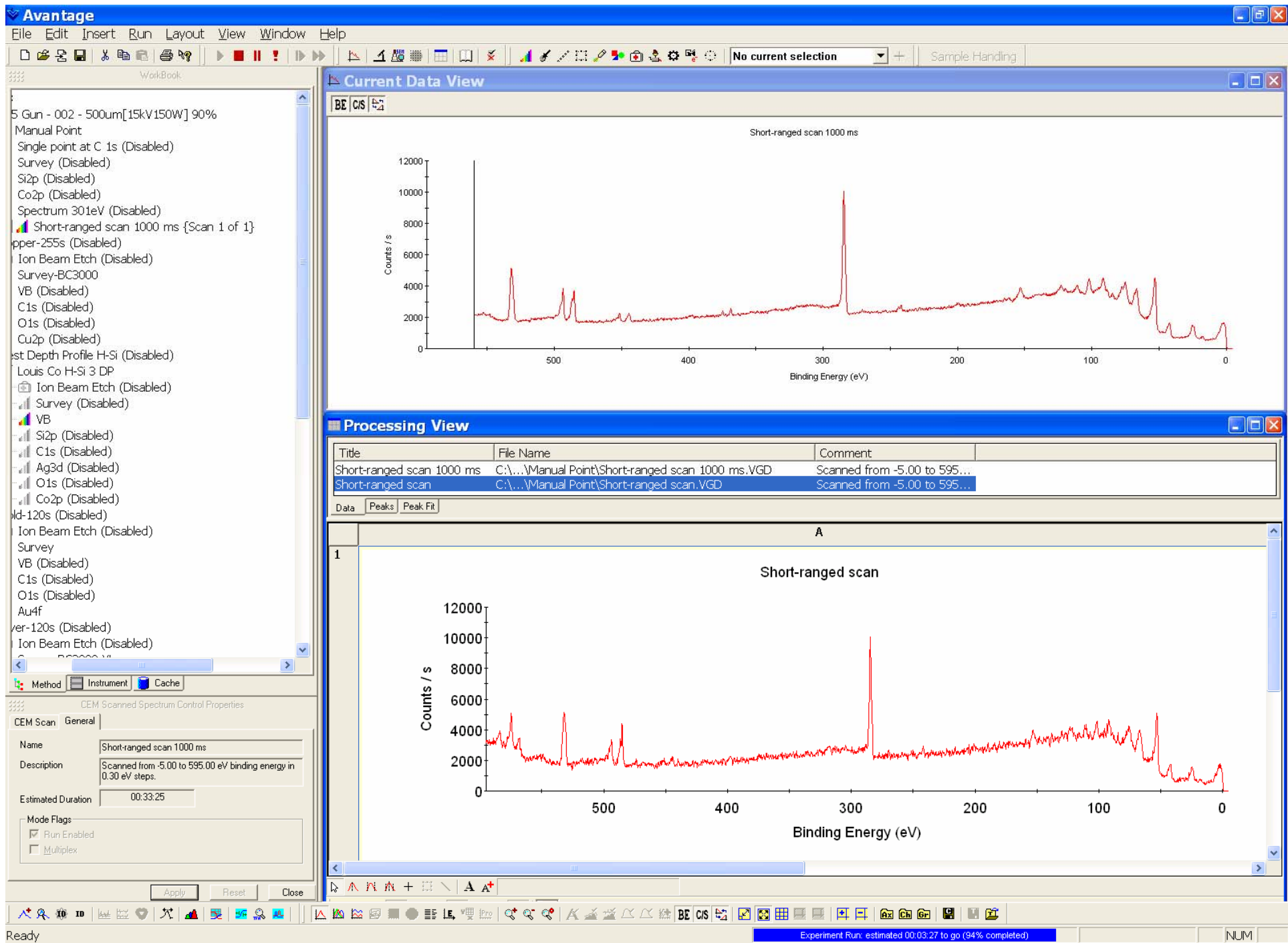
|   | A | B |
|---|---|---|
| 1 |   |   |
| 2 |   |   |

NavBar

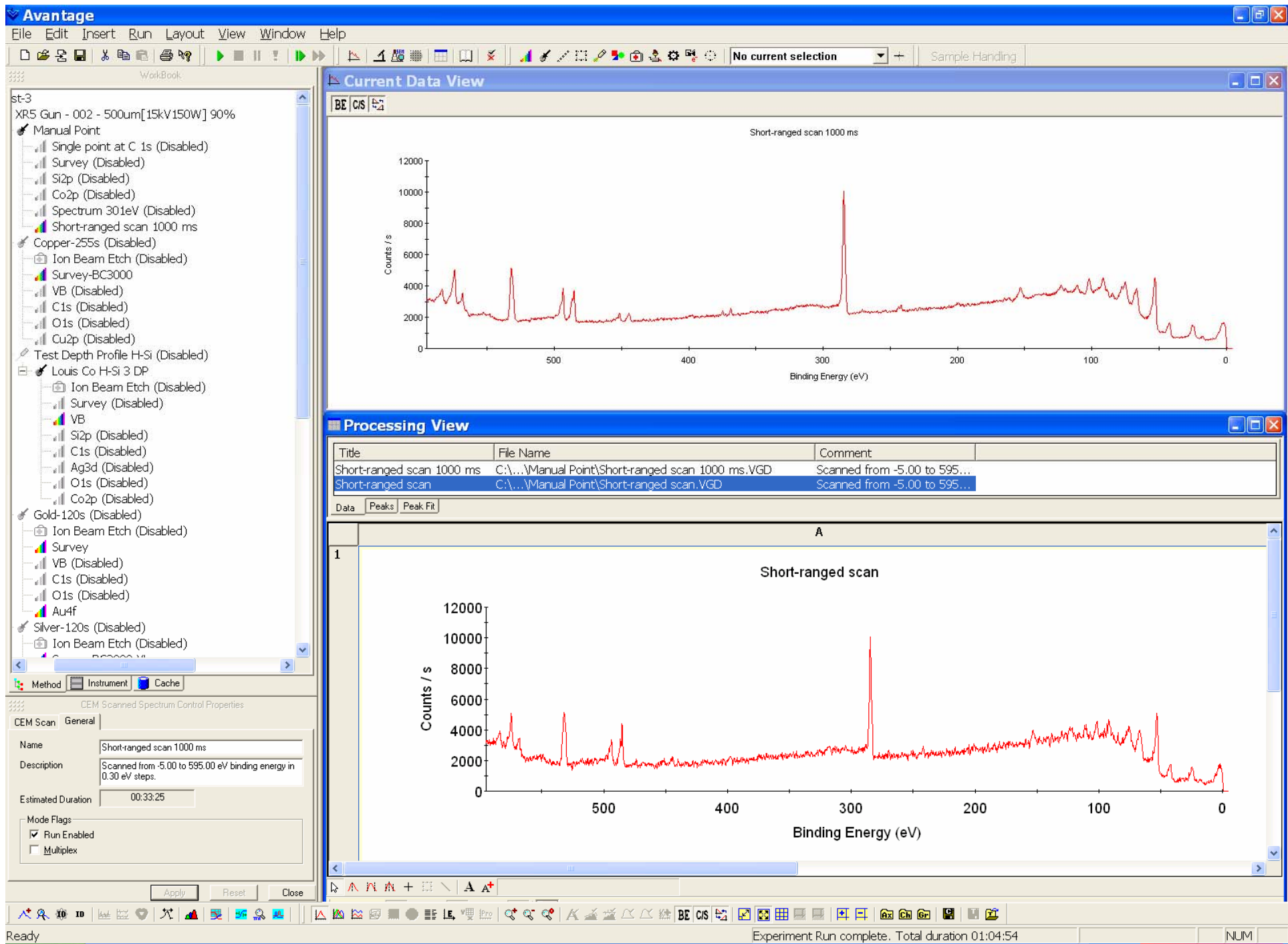
Ready Experiment Run: estimated 00:53:16 to go (7% completed) NUM



Half-way through... after wall-clock time (elapsed time) of 34 min

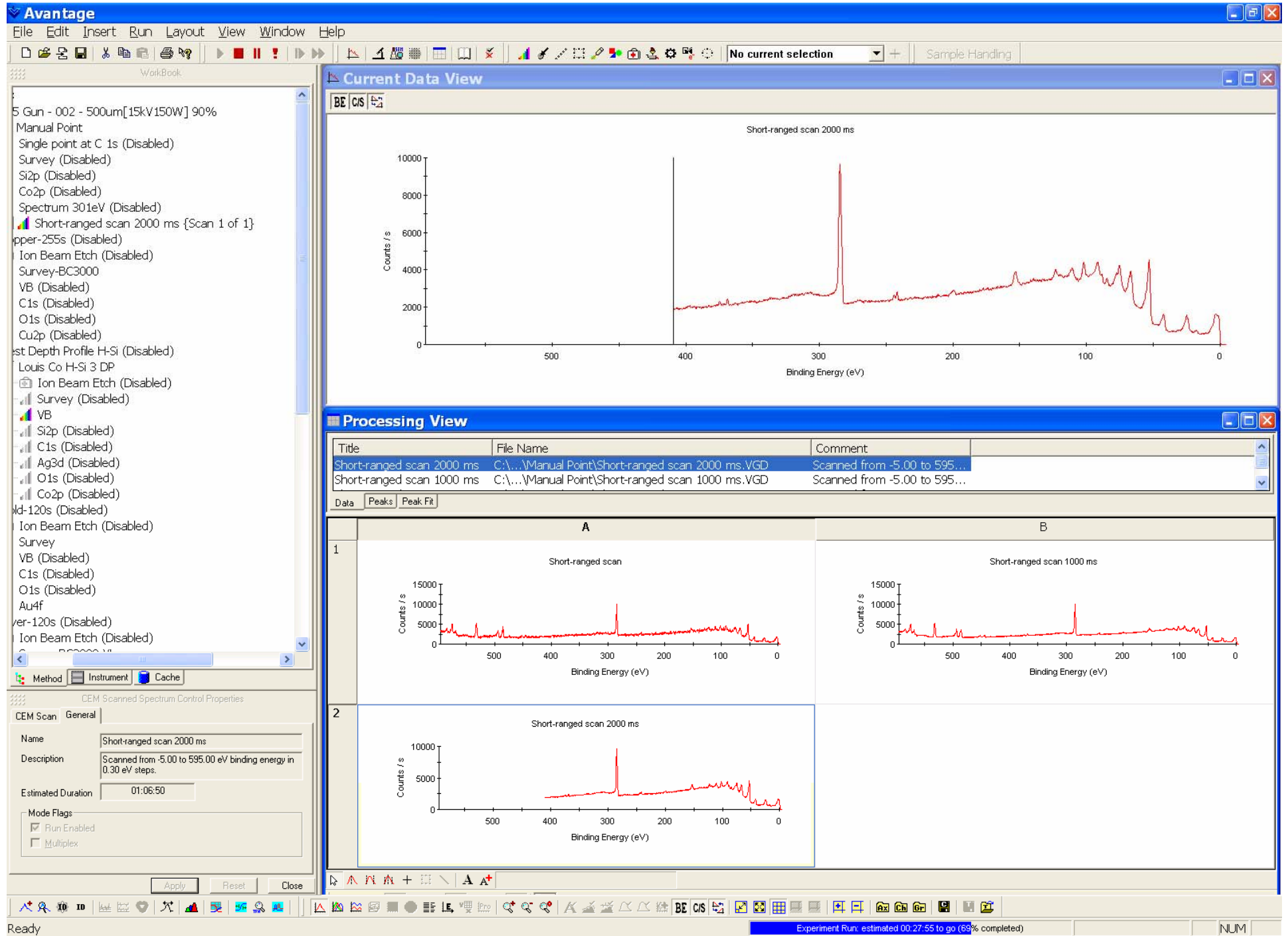


Intermediate screen dump, nearly finished

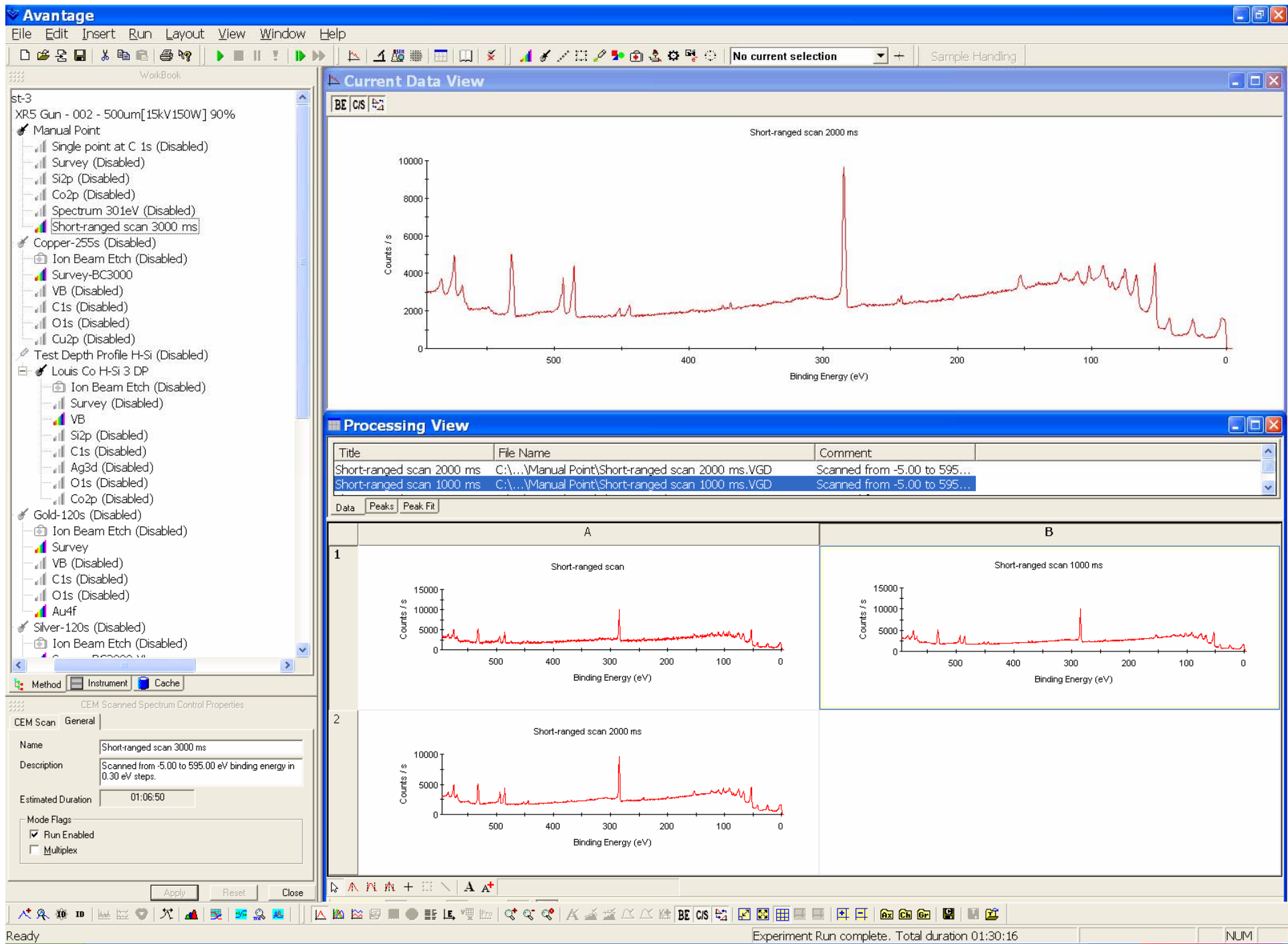


Wall-clock time 1:03:44 h to complete - Advantage said 1:04:54 h

Experiment 3: Set dwell time = 2000 msec  
Repeat scan



Wall-clock time = 1:03 so far



Done. Total wall clock time = 1:29:40 h – Also agreed with Advantage

# Experiment 4: Set dwell time = 3000 msec

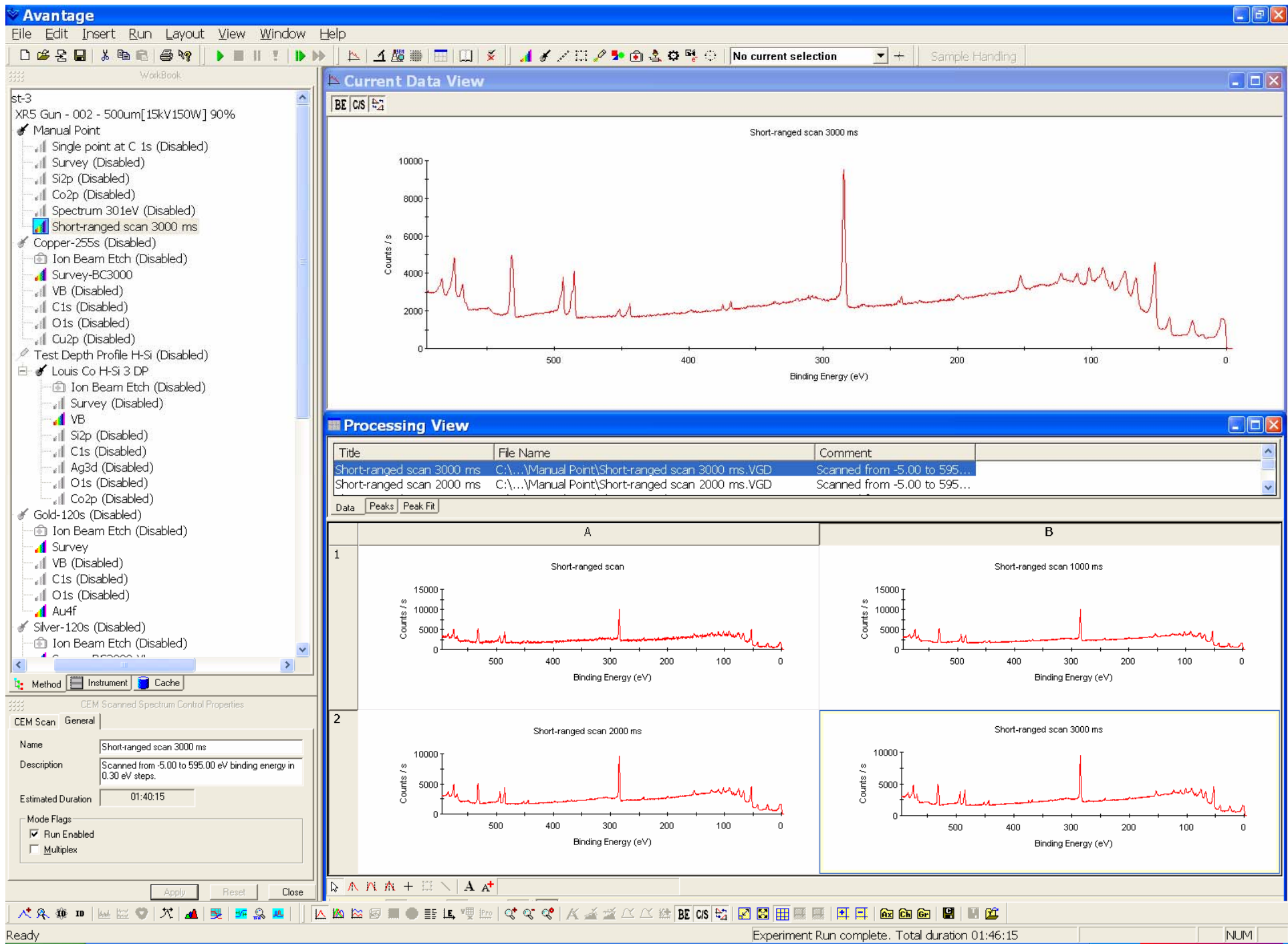
Repeat

The screenshot displays the Avantage software interface with the following components:

- WorkBook:** A list of scan parameters on the left, including "Short-ranged scan 3000 ms {Scan 1 of 1}" which is currently selected.
- Current Data View:** A plot titled "Short-ranged scan 3000 ms" showing "Counts / s" on the y-axis (0 to 10000) and "Binding Energy (eV)" on the x-axis (500 to 0). A prominent peak is visible at approximately 285 eV.
- Processing View:** A table listing scan data with columns for Title, File Name, and Comment.

| Title                     | File Name   | Comment                      |
|---------------------------|---|------------------------------|
| Short-ranged scan 3000 ms | C:\...\Manual Point\Short-ranged scan 3000 ms.VGD | Scanned from -5.00 to 595... |
| Short-ranged scan 2000 ms | C:\...\Manual Point\Short-ranged scan 2000 ms.VGD | Scanned from -5.00 to 595... |
- CEM Scanned Spectrum Control Properties:** A panel showing scan details for "Short-ranged scan 3000 ms", including a description: "Scanned from -5.00 to 595.00 eV binding energy in 0.30 eV steps" and an estimated duration of 01:40:15.
- Processing View Grid:** Four sub-plots labeled A, B, 1, and 2, each showing a different scan duration: A (Short-ranged scan), B (Short-ranged scan 1000 ms), 1 (Short-ranged scan 2000 ms), and 2 (Short-ranged scan 3000 ms). The 3000 ms scan (plot 2) is highlighted with a yellow border.

Wall clock time = 1:03 h - Advantage said 39:52 m more to go.



Total wall clock time = 1:44:20 h to completed – also agreed with Advantage 1:46:15 h

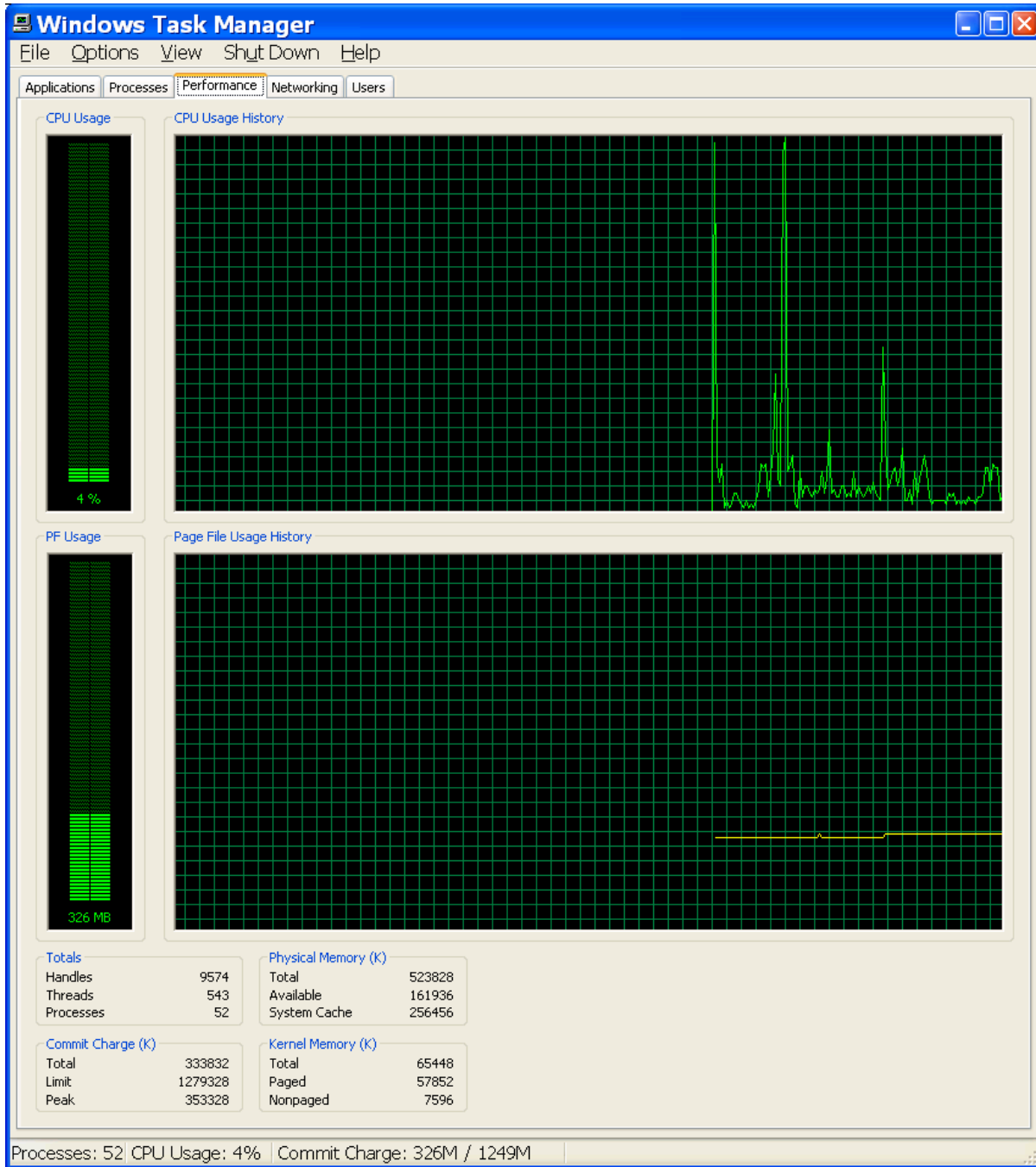
Experiment 5: Repeating dwell time =100 msec  
 Run the scan  
 Poking around to see if I (?) can find something unusual...

The screenshot shows the Windows Task Manager window with the 'Processes' tab active. The window title is 'Windows Task Manager' and it has a menu bar with 'File', 'Options', 'View', 'Shut Down', and 'Help'. The 'Processes' tab is selected, showing a list of running processes with columns for 'Image Name', 'User Name', 'CPU', and 'Mem Usage'. The status bar at the bottom shows 'Processes: 52 CPU Usage: 6% Commit Charge: 324M / 1249M'.

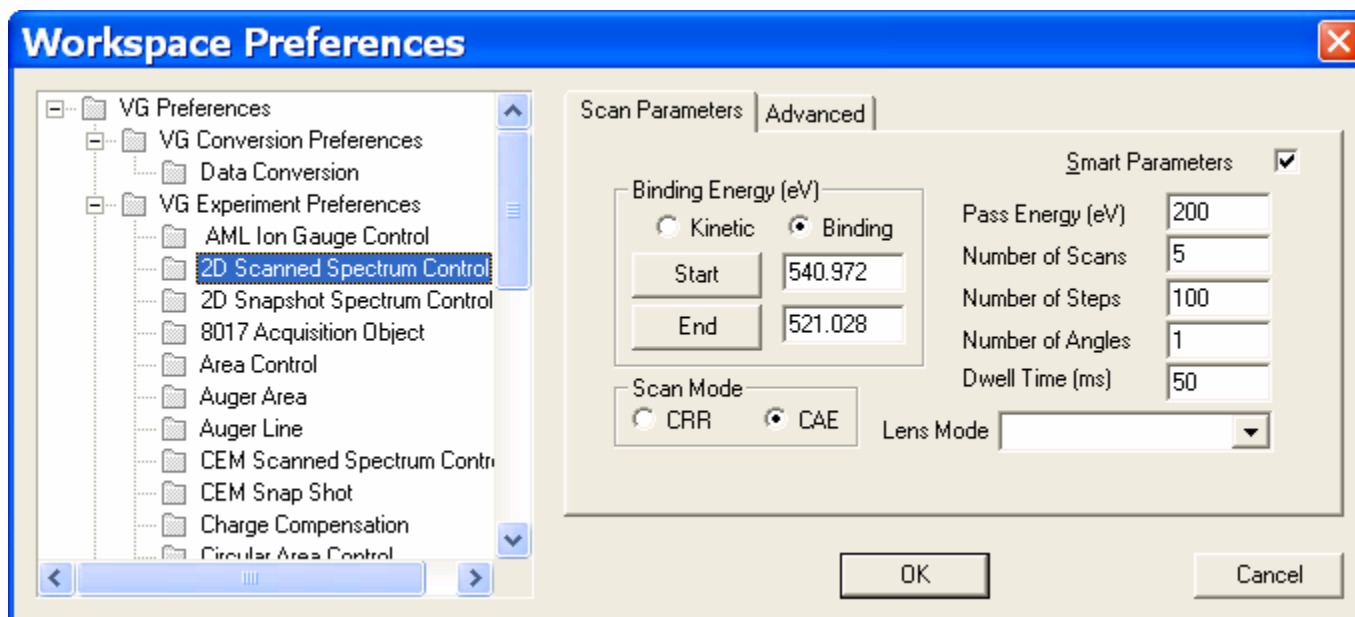
| Image Name           | User Name       | CPU | Mem Usage |
|----------------------|-----------------|-----|-----------|
| IONSCA~1.EXE         | vgengineer      | 00  | 3,644 K   |
| BEAMCO~1.EXE         | vgengineer      | 00  | 3,740 K   |
| X168SE~1.EXE         | vgengineer      | 00  | 3,624 K   |
| DIAGNO~1.EXE         | vgengineer      | 00  | 4,068 K   |
| FEI100~1.EXE         | vgengineer      | 00  | 3,640 K   |
| EventServer.exe      | SYSTEM          | 00  | 2,960 K   |
| Avantage.exe         | vgengineer      | 00  | 20,424 K  |
| gcasDt5serv.exe      | vgengineer      | 00  | 9,336 K   |
| SayTime.exe          | vgengineer      | 00  | 3,176 K   |
| ctfmon.exe           | vgengineer      | 00  | 3,580 K   |
| schedhlp.exe         | vgengineer      | 00  | 2,516 K   |
| TrueImageMonitor.exe | vgengineer      | 00  | 3,100 K   |
| VPTTray.exe          | vgengineer      | 00  | 4,296 K   |
| ccApp.exe            | vgengineer      | 00  | 6,860 K   |
| Directcd.exe         | vgengineer      | 00  | 5,268 K   |
| pdesk.exe            | vgengineer      | 00  | 3,740 K   |
| wordpad.exe          | vgengineer      | 00  | 71,284 K  |
| explorer.exe         | vgengineer      | 01  | 15,412 K  |
| Spectrometer.exe     | SYSTEM          | 00  | 3,296 K   |
| NPROTECT.EXE         | SYSTEM          | 00  | 4,604 K   |
| mgabg.exe            | SYSTEM          | 00  | 1,556 K   |
| gearsec.exe          | SYSTEM          | 00  | 1,160 K   |
| DefWatch.exe         | SYSTEM          | 00  | 1,380 K   |
| ccSetMgr.exe         | SYSTEM          | 00  | 3,576 K   |
| schedul2.exe         | SYSTEM          | 00  | 1,744 K   |
| alg.exe              | LOCAL SERVICE   | 00  | 3,472 K   |
| XR5SER~1.EXE         | vgengineer      | 00  | 4,404 K   |
| M229IO~1.EXE         | vgengineer      | 00  | 3,044 K   |
| spoolsv.exe          | SYSTEM          | 00  | 5,096 K   |
| svchost.exe          | LOCAL SERVICE   | 00  | 4,436 K   |
| svchost.exe          | NETWORK SERVICE | 00  | 3,184 K   |
| svchost.exe          | SYSTEM          | 00  | 17,696 K  |
| NSCService.exe       | SYSTEM          | 00  | 3,056 K   |
| svchost.exe          | NETWORK SERVICE | 00  | 4,240 K   |
| svchost.exe          | SYSTEM          | 00  | 4,936 K   |
| ccEvtMgr.exe         | SYSTEM          | 00  | 1,796 K   |
| lsass.exe            | SYSTEM          | 00  | 1,200 K   |
| services.exe         | SYSTEM          | 00  | 4,348 K   |
| winlogon.exe         | SYSTEM          | 00  | 928 K     |
| csrss.exe            | SYSTEM          | 00  | 3,308 K   |
| X352.exe             | vgengineer      | 00  | 2,732 K   |
| PQV2Svc.exe          | SYSTEM          | 00  | 10,764 K  |
| smss.exe             | SYSTEM          | 00  | 372 K     |
| wdfmgr.exe           | LOCAL SERVICE   | 00  | 1,760 K   |
| Rtvscan.exe          | SYSTEM          | 00  | 49,124 K  |
| NOPDB.EXE            | SYSTEM          | 00  | 3,124 K   |
| taskmgr.exe          | vgengineer      | 04  | 5,484 K   |
| XRAYGU~1.EXE         | vgengineer      | 00  | 2,940 K   |
| SavRoam.exe          | SYSTEM          | 00  | 3,532 K   |
| RAFIBE~1.EXE         | vgengineer      | 00  | 3,952 K   |
| System               | SYSTEM          | 01  | 232 K     |
| System Idle Process  | SYSTEM          | 94  | 16 K      |

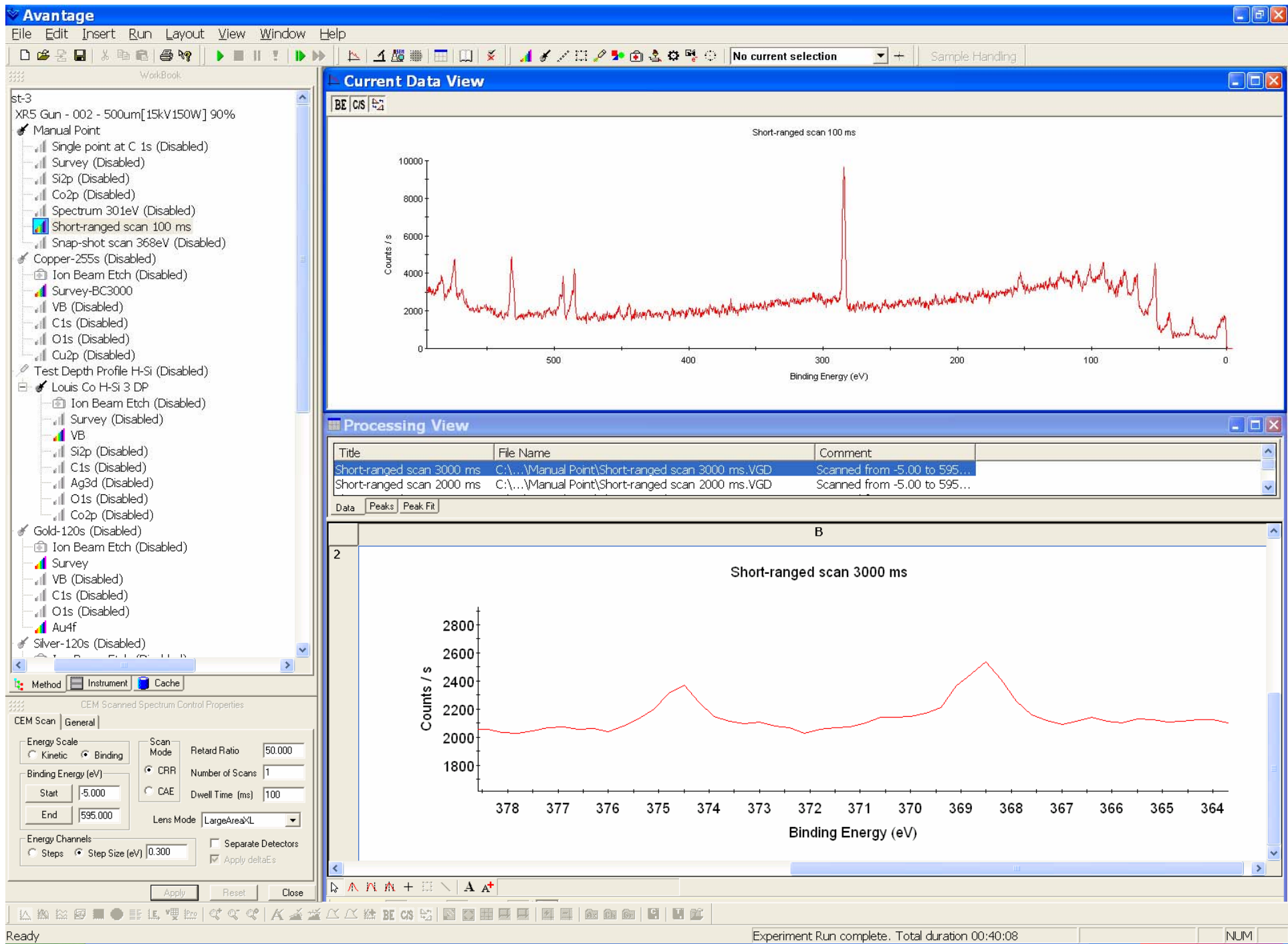
At the bottom of the window, there is a checkbox labeled 'show processes from all users' which is currently unchecked. To the right of this checkbox is an 'End Process' button. The status bar at the very bottom of the window displays: 'Processes: 52 CPU Usage: 6% Commit Charge: 324M / 1249M'.

Still poking...



Still poking...





Wall clock time = 40:18 m – agreed with Advantage 40:08 m – But this is a few minutes different from Experiment 1.

## SUMMARY

Scan range = -5 to 595 V (or 600 V)  
Step size = 0.3 V (or 2000 steps or is it 2001 steps)  
Lens mode: LAXL

| Experiment | Dwell time (msec) | Wall-clock time  | Time difference |
|------------|-------------------|------------------|-----------------|
| 1          | 100               | 37:46 or 38 m    |                 |
| 2          | 1000              | 1:03:44 or 64 m  | 2-1 = 26 m      |
| 3          | 2000              | 1:29:40 or 90 m  | 3-2 = 26 m      |
| 4          | 3000              | 1:44:20 or 104 m | 4-3 = 14 m      |
| 5          | 100               | 40:08 or 40 m    |                 |
|            |                   |                  |                 |