

```
In [1]: # setup the mantid directories and import the required libraries
import os, sys
sys.path.append(r'C:\MantidInstall')
sys.path.append(r'C:\MantidInstall\bin')
sys.path.append(r'u:\user\mantid\TestingPointDetectorReduction')
from mantid.simpleapi import *
from WrappedReduction import *
import matplotlib.pyplot as plt
# This is required if you wish to have inline plotting
%pylab inline
# that's default image size for this interactive session
plt.rcParams['figure.figsize'] = 10, 6
plt.rcParams['font.size'] = 18.0
```

Welcome to pylab, a matplotlib-based Python environment [backend:  
module://IPython.zmq.pylab.backend\_inline].  
For more information, type 'help(pylab)'.

## Silicon block

S2 South Jaw was sticking so the resolution and overall slit aperture may be asymmetric resulting in the slope on the total reflection. Notice however that the data still showed a good overlap.

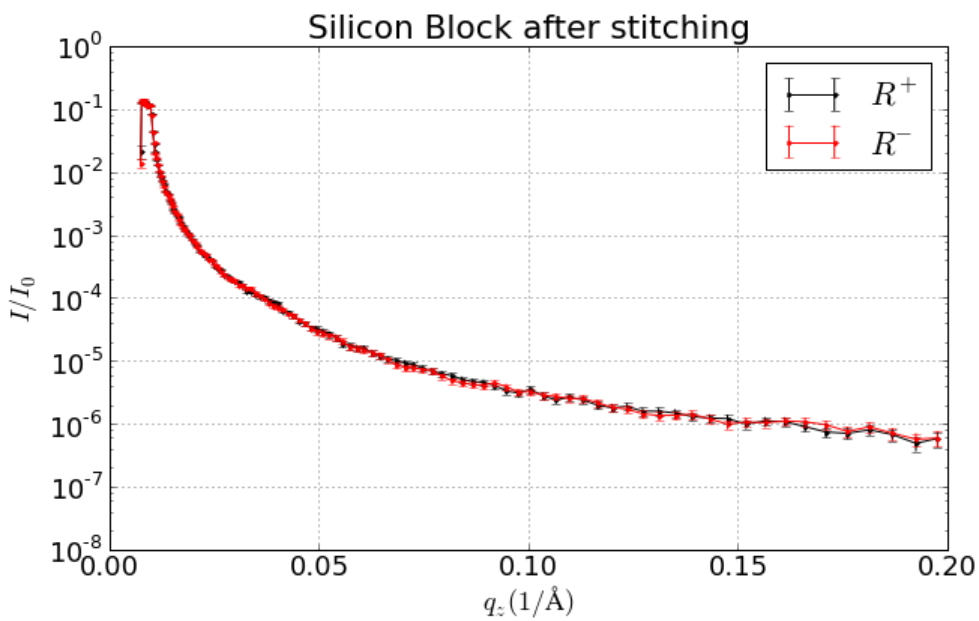
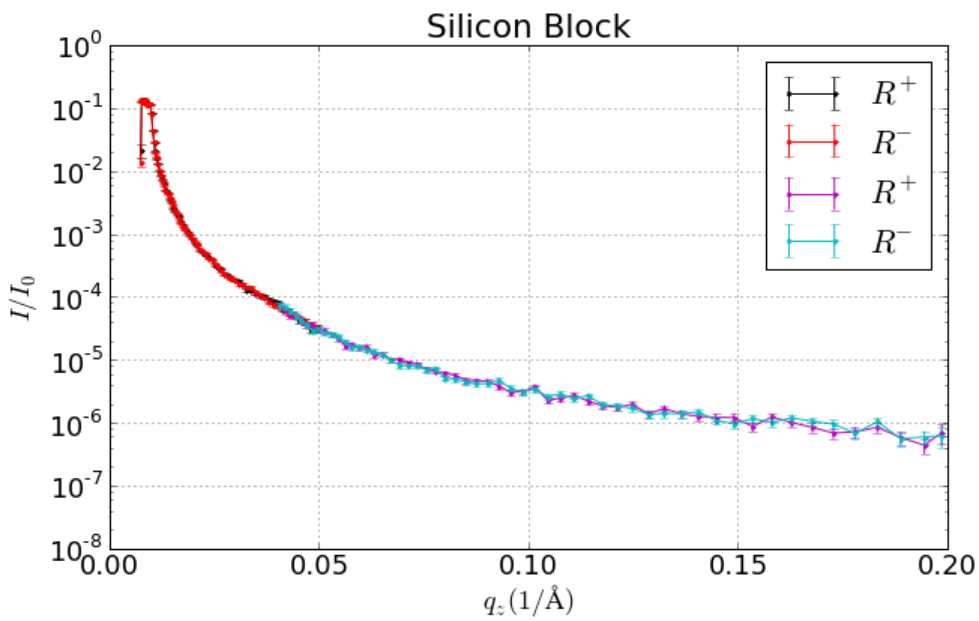
```
In [2]: r1q = refq('11048',theta=0.5)
r2q = refq('11049',theta=2.0)

#fig=plt.figure(figsize=(10,6), dpi=600)
#plots([r1q,r2q], 'Silicon Block', Limits=[0.00, 0.2, 1e-8, 1])

rr1=Rebin(r1q, '0.005,-0.03,0.05')
rr2=Rebin(r2q, '0.04,-0.03,0.2');
fig=plt.figure(figsize=(10,6), dpi=600)
plots([rr1,rr2], 'Silicon Block', Limits=[0.00, 0.2, 1e-8, 1])

rr, scale=Stitch1DMany('rr1,rr2', Params='-0.03')
fig=plt.figure(figsize=(10,6), dpi=600)
plots(rr, 'Silicon Block after stitching', Limits=[0.00, 0.2, 1e-8, 1])
```

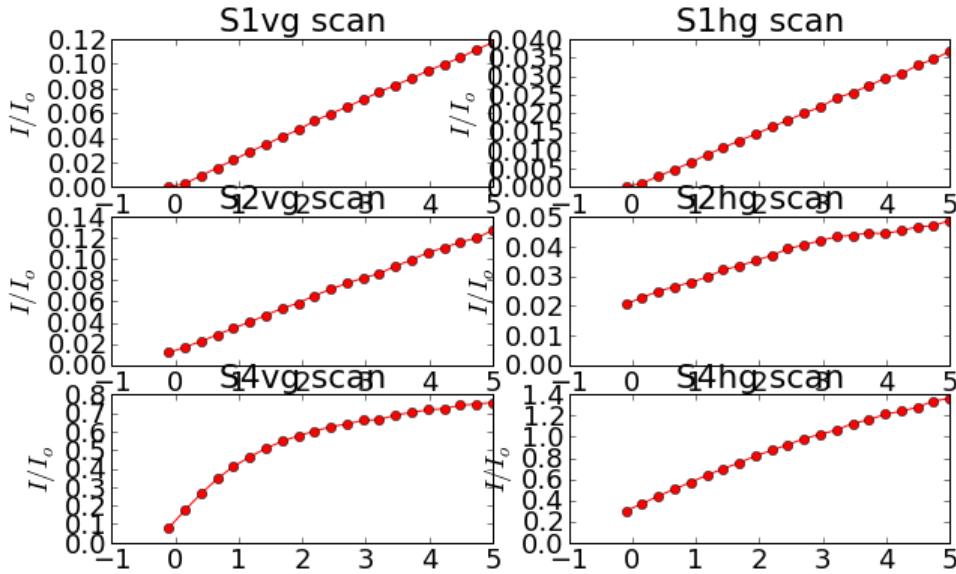
```
['11048']
['11049']
[0.0050000000000000000001, -0.029999999999999999, 0.20000000000000001]
[0.0050000000000000000001, -0.029999999999999999, 0.20000000000000001]
```



```
In [29]: fig=plt.figure(figsize=(10,6), dpi=600)
plt.subplot(3,2,1); PlotAlignmentScan(r'U:\user\test\s1vg_06-May-2014134340.dat',RunTitle='S1vg sc
plt.subplot(3,2,3); PlotAlignmentScan(r'U:\user\test\s2vg_06-May-2014134650.dat',RunTitle='S2vg sc
plt.subplot(3,2,5); PlotAlignmentScan(r'U:\user\test\s4vg_06-May-2014134952.dat',RunTitle='S4vg sc

plt.subplot(3,2,2); PlotAlignmentScan(r'U:\user\test\s1hg_06-May-2014135402.dat',RunTitle='S1hg sc
plt.subplot(3,2,4); PlotAlignmentScan(r'U:\user\test\s2hg_06-May-2014135715.dat',RunTitle='S2hg sc
plt.subplot(3,2,6); PlotAlignmentScan(r'U:\user\test\s4hg_06-May-2014140017.dat',RunTitle='S4hg sc

# Work in progress. Need to enable fit option for gauss, step-up, step-down ...
```



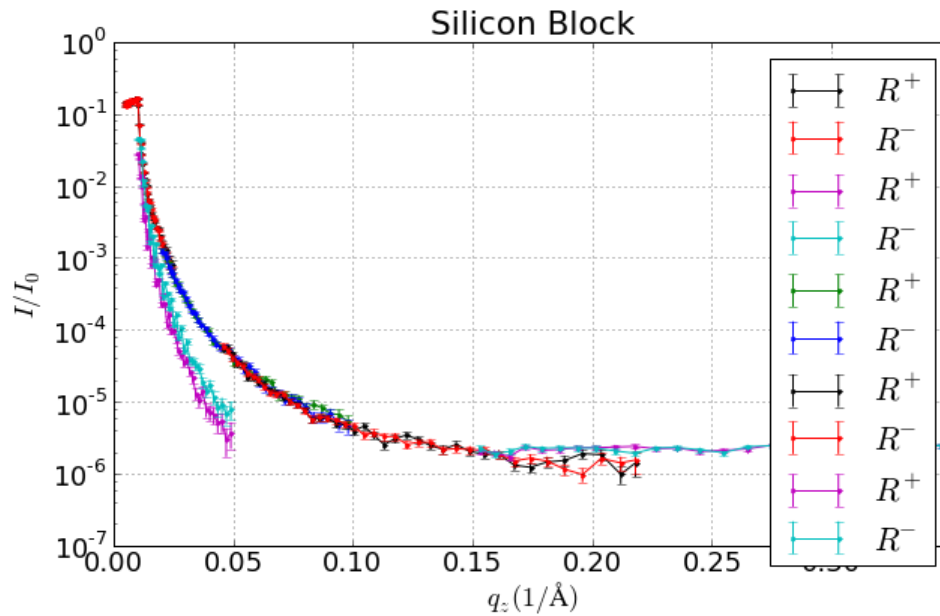
```
In [4]: r1q = refq('11056',theta=0.25)
r2q = refq('10157',theta=0.5)
r3q = refq('11058+11059', theta=1.0)
r4q = refq('11060+11061+11062+11063', theta=2.0)
r5q = refq('11064+11065+11066+11067+11068+11069+11070+11071', theta=3.75)

rr1=Rebin(r1q,'0.005,-0.04,0.025')
rr2=Rebin(r2q,'0.01,-0.04,0.05');
rr3=Rebin(r3q,'0.02,-0.04,0.1')
rr4=Rebin(r4q,'0.045,-0.04,0.22')
rr5=Rebin(r5q,'0.15,-0.04,0.35')

fig=plt.figure(figsize=(10,6), dpi=600)
plots([rr1,rr2,rr3*0.5,rr4,rr5],'Silicon Block', Limits=[0.00, 0.35, 1e-7, 1])

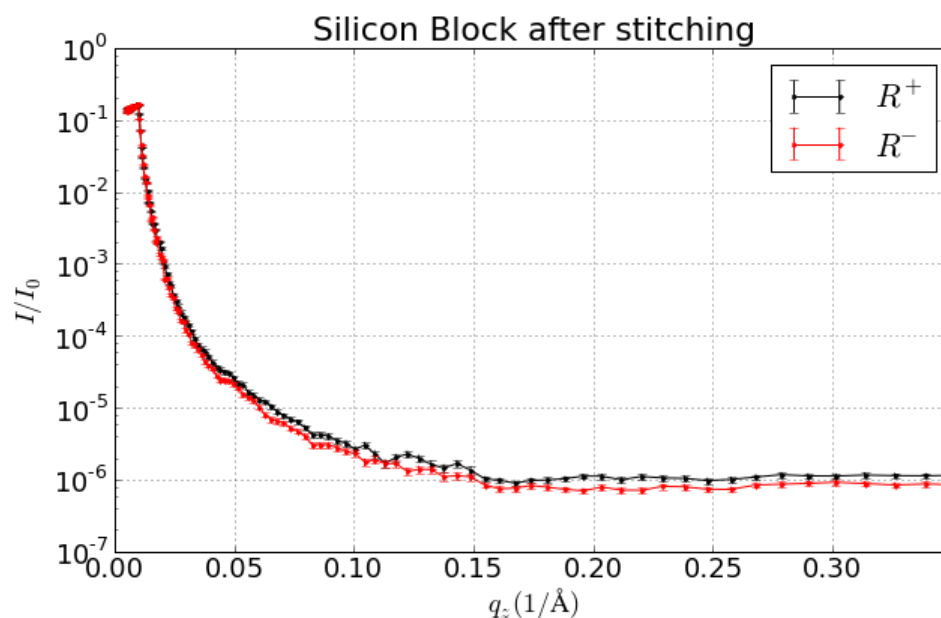
#rr,scale=Stitch1DMany('rr1,rr2',Params='-0.03')
#fig=plt.figure(figsize=(10,6), dpi=600)
#plots(rr,'Silicon Block after stitching', Limits={0.00, 0.2, 1e-8, 1})
```

```
['11056']
['10157']
11058+11059
11060+11061+11062+11063
11064+11065+11066+11067+11068+11069+11070+11071
```



```
In [5]: rr,scale=Stitch1DMany('rr1,rr2,rr3,rr4,rr5',Params='-0.04')
fig=plt.figure(figsize=(10,6), dpi=600)
plots(rr,'Silicon Block after stitching', Limits=[0.00, 0.35, 1e-7, 1])
print 'Stitching scale: ',scale
```

```
[0.0050000000000000001, -0.040000000000000001, 0.050000000000000003]
[0.0050000000000000001, -0.040000000000000001, 0.10000000000000001]
[0.0050000000000000001, -0.040000000000000001, 0.22]
[0.0050000000000000001, -0.040000000000000001, 0.3499999999999998]
[0.0050000000000000001, -0.040000000000000001, 0.050000000000000003]
[0.0050000000000000001, -0.040000000000000001, 0.10000000000000001]
[0.0050000000000000001, -0.040000000000000001, 0.22]
[0.0050000000000000001, -0.040000000000000001, 0.3499999999999998]
Stitching scale: 0.352143840736
```



Load data saved from genie which has gone through the same process.

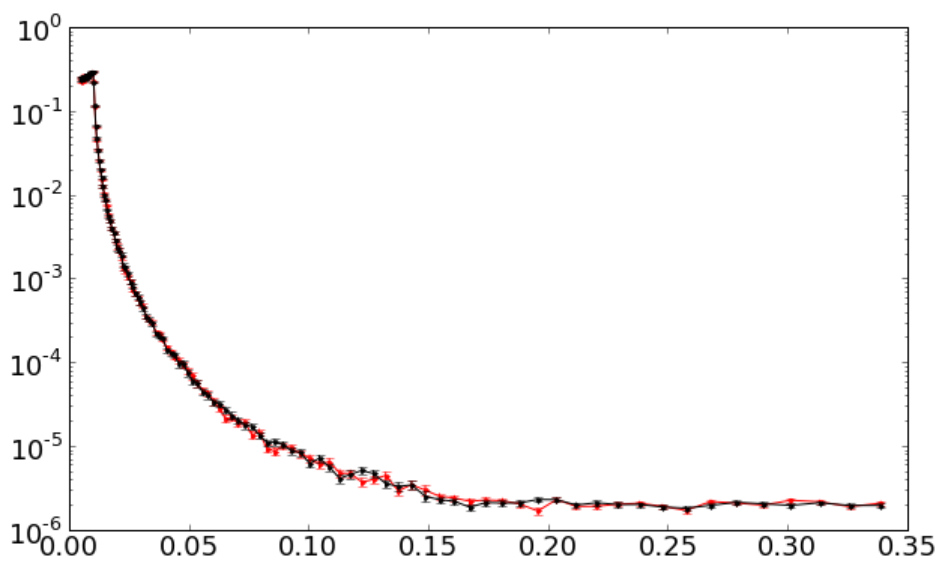
Scale factors from genie

No. of output bins will be 109

scale factor for data set	2	is	0.9215863
scale factor for data set	3	is	0.9468634
scale factor for data set	4	is	1.005192
scale factor for data set	5	is	1.661707

Note: The current stitch1dmany only outputs one scale factor.

```
In [6]: genie_up=loadtxt(r'u:/user/test/SiFourAnglesStitched.u')
genie_dn=loadtxt(r'u:/user/test/SiFourAnglesStitched.d')
fig=plt.figure(figsize=(10,6), dpi=600)
plt.errorbar(genie_up[:,0],genie_up[:,1],yerr=genie_up[:,2],fmt='r.-')
plt.errorbar(genie_dn[:,0],genie_dn[:,1],yerr=genie_dn[:,2],fmt='k.-')
yscale('log')
```



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Move to unpolarized beam to track down our background issues.

#### Changes include:

- 1) Adding cadmium plate to the front of the polarizer
  - 2) Adding a makeshift slit 3 made from  $B_4C$  plates and hepco extrusion
  - 3) Adding a cadmium blocker in the guide field after slit 2
-

```

In [33]: # The transmission run
trans=transmission('11080')

r1q = refq('11079',theta=0.25,Transmission=trans)
r2q = refq('11082',theta=0.5,Transmission=trans)
r3q = refq('11083+11084',theta=1.0,Transmission=trans)
r4q = refq('11084-11088',theta=2.0,Transmission=trans)
r5q = refq('11089-11096',theta=4.0,Transmission=trans)

fig=plt.figure(figsize=(10,6),dpi=600)
#plots([r1q,r2q,r3q,r4q], 'Silicon Block Unpolarized', Limits=[0.00, 0.5, 1e-8, 1])
plt.errorbar(centerbins(r1q.readX(0)),r1q.readY(0),yerr=r1q.readE(0),fmt='k.-')
plt.errorbar(centerbins(r2q.readX(0)),r2q.readY(0),yerr=r2q.readE(0),fmt='r.-')
plt.errorbar(centerbins(r3q.readX(0)),r3q.readY(0),yerr=r3q.readE(0),fmt='b.-')
plt.errorbar(centerbins(r4q.readX(0)),r4q.readY(0),yerr=r4q.readE(0),fmt='g.-')
plt.errorbar(centerbins(r5q.readX(0)),r5q.readY(0),yerr=r5q.readE(0),fmt='c.-')
plt.yscale('log')
plt.xlabel(r'$q_z$ (1/\AA)$'); plt.ylabel('$I/I_0$'); plt.title('')

rr1=Rebin(r1q,'0.005,-0.04,0.03')
rr2=Rebin(r2q,'0.01,-0.04,0.065');
rr3=Rebin(r3q,'0.02,-0.04,0.15')
rr4=Rebin(r4q,'0.045,-0.04,0.4')
rr5=Rebin(r5q,'0.06,-0.04,0.8')

fig=plt.figure(figsize=(10,6),dpi=600)
plt.errorbar(centerbins(rr1.readX(0)),rr1.readY(0),yerr=rr1.readE(0),fmt='k.-')
plt.errorbar(centerbins(rr2.readX(0)),rr2.readY(0),yerr=rr2.readE(0),fmt='r.-')
plt.errorbar(centerbins(rr3.readX(0)),rr3.readY(0),yerr=rr3.readE(0),fmt='b.-')
plt.errorbar(centerbins(rr4.readX(0)),rr4.readY(0),yerr=rr4.readE(0),fmt='g.-')
plt.errorbar(centerbins(rr5.readX(0)),rr5.readY(0),yerr=rr5.readE(0),fmt='c.-')
plt.yscale('log')
plt.xlabel(r'$q_z$ (1/\AA)$'); plt.ylabel('$I/I_0$'); plt.title('')

#plots([rr1,rr2,rr3], 'Silicon Block Unpolarized', Limits=[0.00, 0.5, 1e-8, 1])

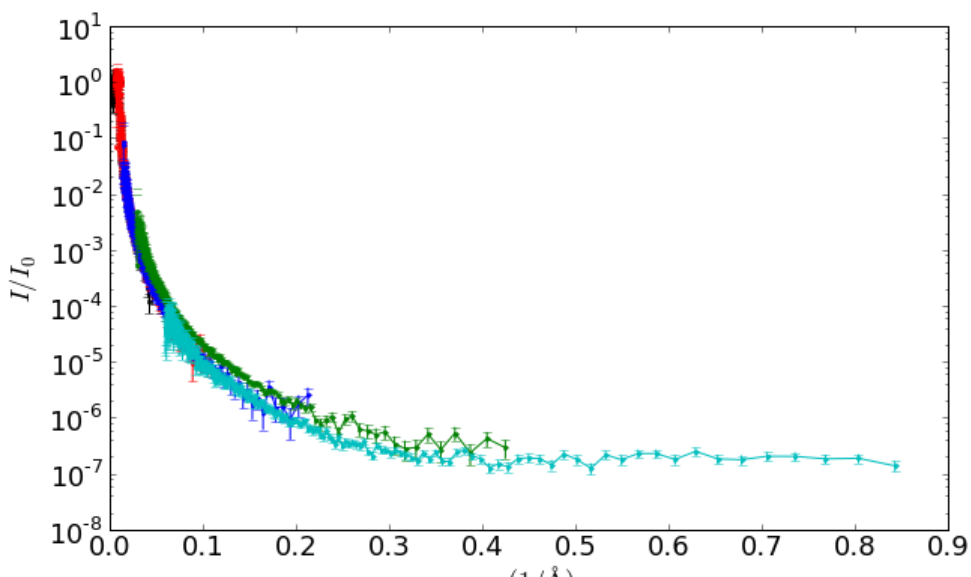
rr, scale=Stitch1DMany('rr1,rr2,rr3,rr4,rr5',Params='-0.04')
fig=plt.figure(figsize=(10,6),dpi=600)
plt.errorbar(centerbins(rr.readX(0)),rr.readY(0),yerr=rr.readE(0),fmt='k.-')
plt.yscale('log')
plt.xlabel(r'$q_z$ (1/\AA)$'); plt.ylabel('$I/I_0$'); plt.title('')
#plots(rr, 'Silicon Block after stitching', Limits=[0.00, 0.5, 1e-8, 1])
print 'Stitching scale: ',scale

```

```

['11079']
['11082']
11083+11084
['11084-11088']
['11089-11096']
[0.005000000000000001, -0.04000000000000001, 0.06500000000000002]
[0.005000000000000001, -0.04000000000000001, 0.14999999999999999]
[0.005000000000000001, -0.04000000000000001, 0.40000000000000002]
[0.005000000000000001, -0.04000000000000001, 0.8000000000000004]
Stitching scale: 0.86940234932

```



```
In [14]: print type(r1q)
         print type(r1)
```

```
<class 'mantid.api._api.MatrixWorkspace'>
<class 'mantid.api._api.WorkspaceGroup'>
```

```
In [19]: 4*pi*sin(pi/180.0 * 4.0)/array([ 15.0,  1.0 ])
```

```
Out[19]: array([ 0.05843905,  0.8765857
                ])
```

```
In [ ]:
```