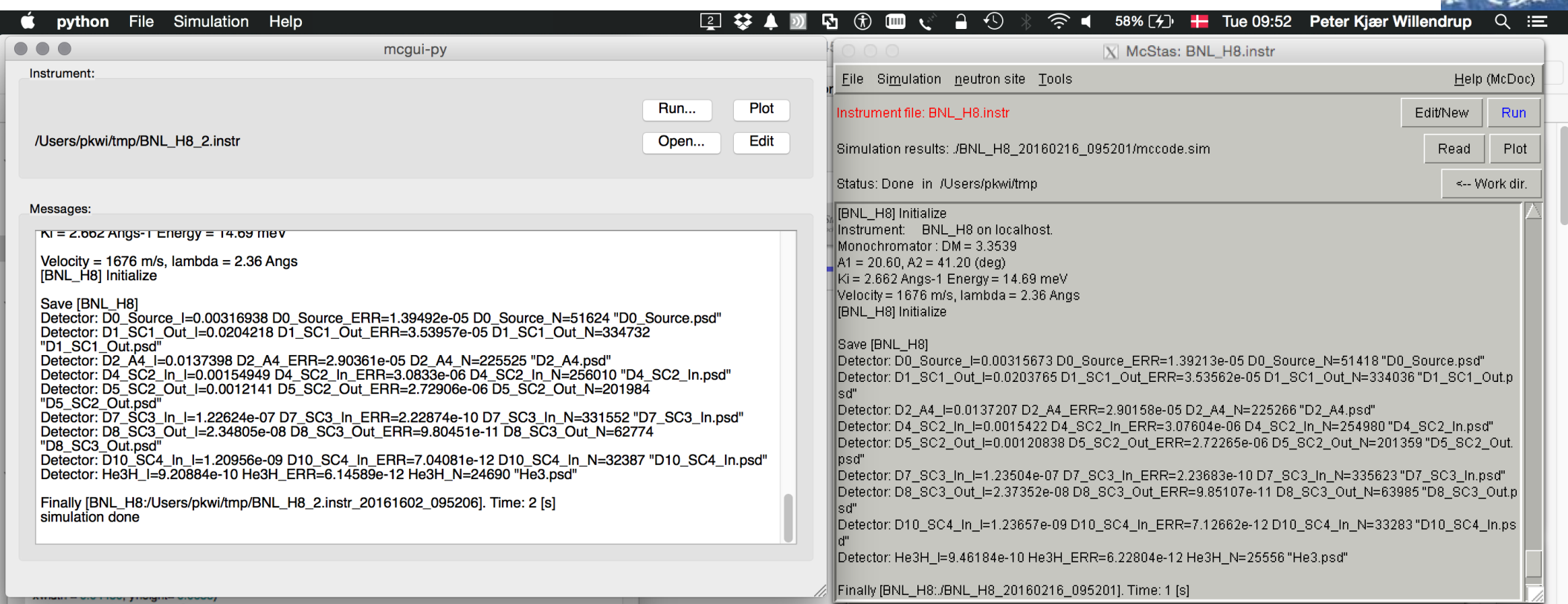


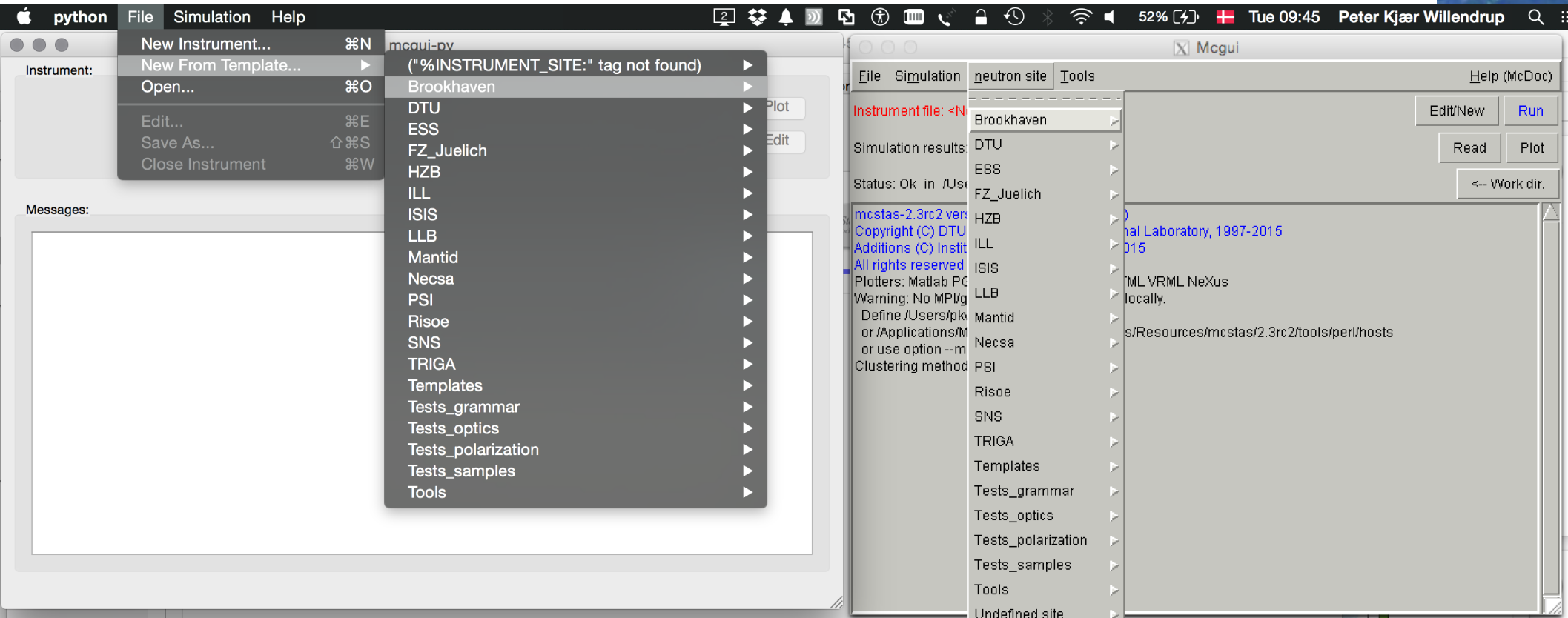
Extras - quick tour of available tools



mcgui - pl vs py versions



mcgui - pl vs py versions



*mcstas: /Users/pkwi/tmp/BNL_H8_2.instr

```
TRACE
/* Source description */
COMPONENT Origin=Progress_bar()
AT (0,0,0) ABSOLUTE

/* a flat constant source */
COMPONENT Source = Source_simple(
  radius = 0.10,
  dist = 2.7473,
  focus_xw = 0.031, focus_yh = 0.054,
  E0 = Ei,
  dE = 0.03*Ei)
AT (0,0,0) ABSOLUTE

CO
COMPONENT
COPY
CavitiesIn
CavitiesOut
Collimator_ROC
Collimator_linear
Collimator_radial

nx=20, ny=20, filename="D1_SC1_Out.psd")
AT (0.0, 0, 0.9145) RELATIVE SC1

COMPONENT As1 = Slit(
  xwidth = 0.04450, yheight= 0.0635)
AT (0, 0, 3.6998) RELATIVE Source

COMPONENT As2 = Slit(
  xwidth = 0.04450, yheight= 0.0635)
AT (0, 0, 4.0808) RELATIVE Source

COMPONENT As3 = Slit(
  xwidth = 0.04450, yheight= 0.0635)
AT (0, 0, 4.1189) RELATIVE Source

COMPONENT As4 = Slit(
  xwidth = 0.04450, yheight= 0.0635)
AT (0, 0, 4.4141) RELATIVE Source

COMPONENT D2_A4 = PSD_monitor(
  xwidth = 0.04450, yheight= 0.0635,
  nx=20, ny=20, filename="D2_A4.psd")
AT (0, 0, 0.0001) RELATIVE As4

COMPONENT Mono_Cradle = Arm()
AT (0, 0, 5.2746) RELATIVE Source ROTATED (0, A1, 0) RELATIVE Source

SPLIT COMPONENT PG1Xtal = Monochromator_flat(
  zwidth = 0.1, yheight = 0.08,
```

Edit: BNL_H8.instr

File Edit Search View Insert

```
TRACE
/* Source description */
COMPONENT Origin=Progress_bar()
AT (0,0,0) ABSOLUTE

/* a flat constant source */
COMPONENT Source = Source_simple(
  radius = 0.10,
  dist = 2.7473,
  focus_xw = 0.031, focus_yh = 0.054,
  E0 = Ei,
  dE = 0.03*Ei)
AT (0,0,0) ABSOLUTE

COMPONENT D0_Source = PSD_monitor(
  xwidth = 0.03, yheight= 0.054,
  nx=20, ny=20, filename="D0_Source.psd")
AT (0, 0, 0.0001) RELATIVE Source

/* SC1 collimator. 40=3 slots, 20=6 slots */

COMPONENT SC1 = Guide(
  w1 = 0.031, h1 = 0.054, l = 0.9144,
  R0 = 1.0, Qc=0.021, alpha=6, m=1, Wv=0.0003)
AT (0.0, 0, 2.7473) RELATIVE Source

COMPONENT D1_SC1_Out = PSD_monitor(
  xwidth = 0.03, yheight= 0.054,
  nx=20, ny=20, filename="D1_SC1_Out.psd")
AT (0.0, 0, 0.9145) RELATIVE SC1

COMPONENT As1 = Slit(
  xwidth = 0.04450, yheight= 0.0635)
AT (0, 0, 3.6998) RELATIVE Source

COMPONENT As2 = Slit(
  xwidth = 0.04450, yheight= 0.0635)
AT (0, 0, 4.0808) RELATIVE Source

COMPONENT As3 = Slit(
  xwidth = 0.04450, yheight= 0.0635)
AT (0, 0, 4.1189) RELATIVE Source

COMPONENT As4 = Slit(
  xwidth = 0.04450, yheight= 0.0635)
AT (0, 0, 4.4141) RELATIVE Source
```

Line: 1 of 248 total, Column: 0

mcgui - pl vs py versions

Component: DiskChopper

Written by: Peter Willendrup
Date: March 9 2006
Version: \$Revision\$
Origin: Risoe
Release: McStas 2.0
Based on Chopper (Philipp Bernhardt), Jitter and beamstop from work by Kaspar Hewitt Klenoe (jan 2006), adjustments by Rob Bewey (march 2006)

Models a disc chopper with nslit identical slits, which are symmetrically distributed on the disc. At time t=0, the centre of the first slit opening will be situated at the vertical axis when phase=0.

For more complicated geometries, see component manual example of DiskChopper GROUPing.

If the chopper is the 1st chopper of the instrument, it sets t time with phase
- Only relevant for when using continuous source modules.

Example: DiskChopper(radius=0.2, theta_0=10, nu=41.7, nslit=3, delay=0, isfirst=1) First chopper
DiskChopper(radius=0.2, theta_0=10, nu=41.7, nslit=3, delay=0, isfirst=0)

diskchopper

theta_0: 0 (deg) Angular width of the slits.
radius: 0.5 (m) Radius of the disc
yheight: (m) Slit height (if = 0, equal to radius). Auto centering of beam at half height.
nu: (Hz) Frequency of the Chopper, $\omega = 2\pi \cdot \nu$ (algebraic sign defines the direction of rotation)
nslit: 3 (1) Number of slits, regularly arranged around the disk
jitter: 0 (s) Jitter in the time phase
delay: 0 (s) Time 'delay'.
isfirst: 0 (0/1) Set it to 1 for the first chopper position in a cw source (it then spreads the neutron time distribution)
n_pulse: 1 (1) Number of pulses (Only if isfirst)
abs_out: 1 (0/1) Absorb neutrons hitting outside of chopper radius?

AT (0 , 0 , 0) RELATIVE PREVIOUS
ROTATED (0 , 0 , 0) RELATIVE PREVIOUS

Insert Cancel

DiskChopper

Component definition: DiskChopper
Based on Chopper (Philipp Bernhardt), Jitter and beamstop from work by Kaspar Hewitt Klenoe (jan 2006), adjustments by Rob Bewey (march 2006)

Author: Peter Willendrup
Origin: Risoe
Instance name:

DESCRIPTION: (read it and fill-in PARAMETERS section below)

Models a disc chopper with nslit identical slits, which are symmetrically distributed on the disc. At time t=0, the centre of the first slit opening will be situated at the vertical axis when phase=0.

For more complicated geometries, see component manual example of DiskChopper GROUPing.

If the chopper is the 1st chopper of the instrument, it sets t time with phase
- Only relevant for when using continuous source modules.

Example: DiskChopper(radius=0.2, theta_0=10, nu=41.7, nslit=3, delay=0, isfirst=1) First chopper
DiskChopper(radius=0.2, theta_0=10, nu=41.7, nslit=3, delay=0, isfirst=0)

PARAMETERS:
(optional parameters may be left blank, see DESCRIPTION section)
Character type parameters usually require quoting, e.g. filename="name"

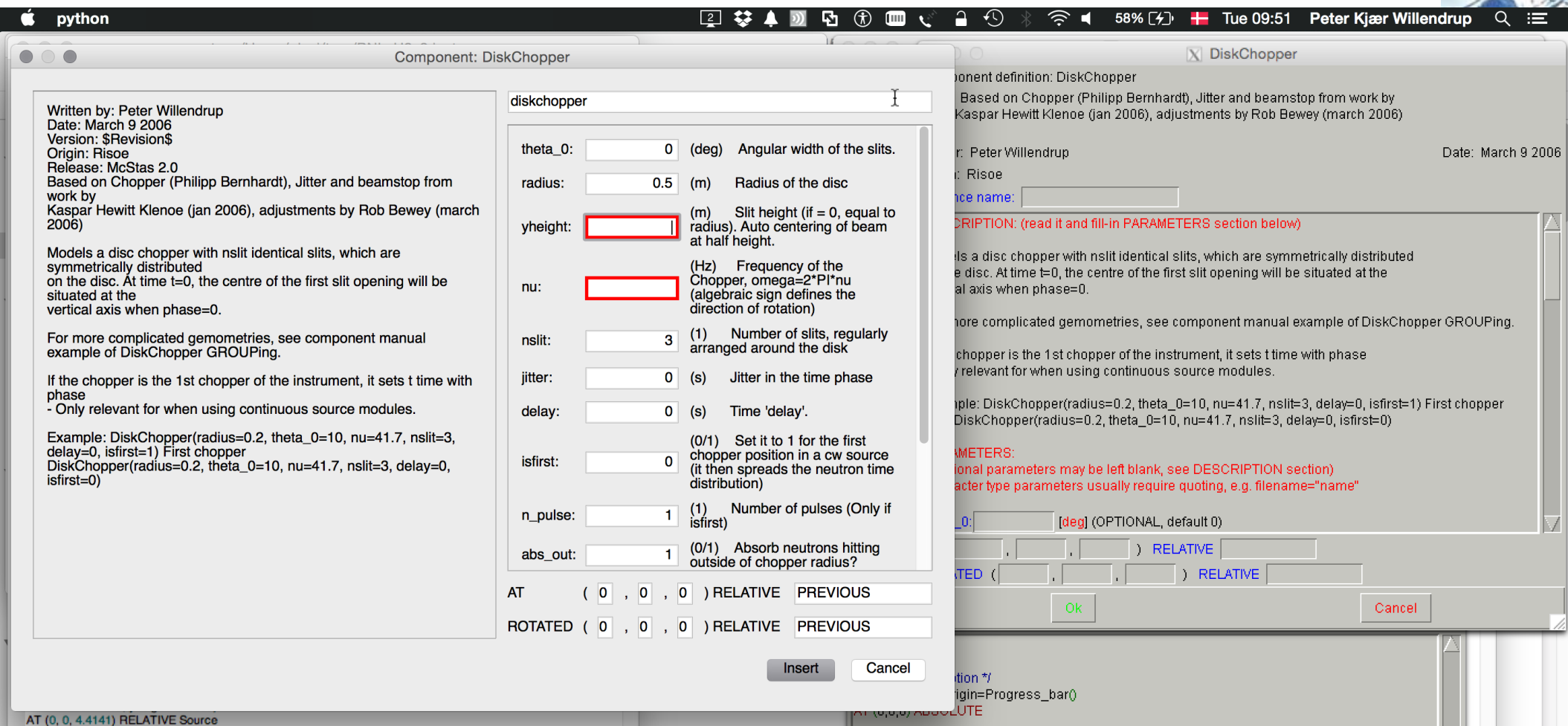
theta_0: [deg] (OPTIONAL, default 0)

AT (, ,) RELATIVE

ROTATED (, ,) RELATIVE

Ok Cancel

mcgui - pl vs py versions

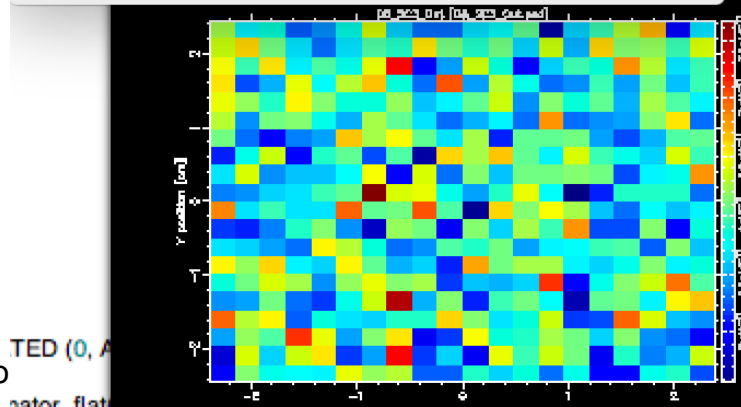


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mcrun pl vs py versions

tmp — pkwi@pkwi-mbp15: ~/tmp — bash — 88x50

```
XQuartzScreenSnapz004.png
pkwi@pkwi-mbp15:~/Pictures$ open XQuartzScreenSnapz00*
pkwi@pkwi-mbp15:~/Pictures$ cd
pkwi@pkwi-mbp15:~$ cd tmp/
pkwi@pkwi-mbp15:~/tmp$ mcrun-py --help
Usage: mcrun.py [-cpnN] Instr [-sndftgahi] params={val|min,max|min,guess,max}...
```

Options:

- version show program's version number and exit
- h, --help show this help message and exit

mcrun options:

- c, --force-compile force rebuilding of instrument
- p FILE, --param=FILE read parameters from file FILE
- N NP, --numpoints=NP set number of scan points
- L, --list use a fixed list of points for linear scanning
- M, --multi run a multi-dimensional scan
- mpi=NB_CPU spread simulation over NB_CPU machines using MPI
- machines=FILE read machine names from FILE (MPI/grid)
- slave=HOST execute simulation on distant HOST (SSH grid)
- optimise=COMP Add COMP to the list of monitors to maximise (optimisation criteria, requires Math::Amoeba)
- optimise-all Maximise all monitors
- optimise-prec=PREC relative requested accuracy of criteria (default: 1e-3)
- optimise-file=FILE store optimisation results in FILE (defaults to: "mcstas.dat")
- test execute McStas self-test and generate report
- no-cflags disable optimising compiler flags for faster compilation
- verbose enable verbose output

Instrument options:

- s SEED, --seed=SEED set random seed (must be: SEED != 0)
- n COUNT, --ncount=COUNT set number of neutrons to simulate
- t, --trace enable trace of neutron through instrument
- g, --gravitation enable gravitation for all trajectories
- d DIR, --dir=DIR put all data files in directory DIR
- format=FORMAT output data files using format FORMAT (format list obtained from <instr>.out -h)
- no-output-files Do not write any data files
- i, --info Detailed instrument information

pkwi@pkwi-mbp15:~/tmp\$

tmp — pkwi@pkwi-mbp15: ~/tmp — bash — 103x49

```
pkwi@pkwi-mbp15:~/tmp$ mcrun --help
mcrun: reading local mcstas configuration from /Users/pkwi/.mcstas/mccode_config.perl
/usr/local/bin/mcrun: reading local mcstas configuration from /Users/pkwi/.mcstas/mccode_config.perl
*** No directory given - placing data in _20160216_095914 ***
Usage: mcrun [-cpnN] Instr [-sndftgahi] params={val|min,max|min,guess,max}
mcrun options:
  -c          --force-compile  Force rebuilding of instrument.
  -p FILE     --param=FILE     Read parameters from file FILE.
  -n COUNT    --ncount=COUNT  Set number of neutrons to simulate.
  -N NP       --numpoints=NP   Set number of scan points.
                        --grid=NB_CPU  Spawn simulations to multiple machine/cores grid.
                        --multi=NB_CPU see the documentation for more info.
  --mpi       --mpi=NB_CPU     Spread simulation over NB_CPU machines using MPI
  --machines=MACHINES          Read machine names from file MACHINES (MPI/grid)
  --slave=HOST                 Execute simulation on distant HOST (SSH grid)
  --optim=COMP                 Add COMP to the list of monitors to maximize
                              (optimization criteria, requires Math::Amoeba)
  --optim          Maximize all monitors
  --optim-prec=PREC           Relative requested accuracy of criteria (1e-3)
  --optim-file=FILENAME       Defines filename for storing optim results.
                              (Defaults to "mcoptim_XXXX.dat")
  --test                    Execute McStas selftest and generate report
  --no-cflags               Does not use CFLAGS for faster compilation

Instr options:
  -s SEED  --seed=SEED      Set random seed (must be != 0)
  -n COUNT --ncount=COUNT  Set number of neutrons to simulate.
  -d DIR   --dir=DIR        Put all data files in directory DIR.
  -f FILE  --file=FILE      Put all data in a single file.
  -t       --trace          Enable trace of neutron through instrument.
  -g       --gravitation    Enable gravitation for all trajectories.
  -a       --data-only      Do not put any headers in the data files.
  --no-output-files        Do not write any data files.
  -h       --help           Show help message.
  -i       --info           Detailed instrument information.
  --format=FORMAT          Output data files using format FORMAT.
                              (format list obtained from <instr>.out -h)

"This program both runs mcstas with Instr and the C compiler to build an
independent simulation program. The following environment variables may be
specified for building the instrument:
  MCSTAS      Location of the McStas and component library
               (/Applications/McStas-2.3rc2.app/Contents/Resources/mcstas/2.3rc2).
  MCSTAS_CC   Name of the C compiler (cc)
  MCSTAS_CFLAGS Options for compilation (-lm -g -O2 -L/usr/local/lib -lnxus -DUSE_NEXUS)
  MCSTAS_FORMAT Default FORMAT to use for data files (PGPLOT)
SEE ALSO: mcstas, mcdoc, mcplot, mcdisplay, mcgui, mcresplot, mcstas2viteess
DOC:      Please visit http://www.mcstas.org/
** No instrument definition name given

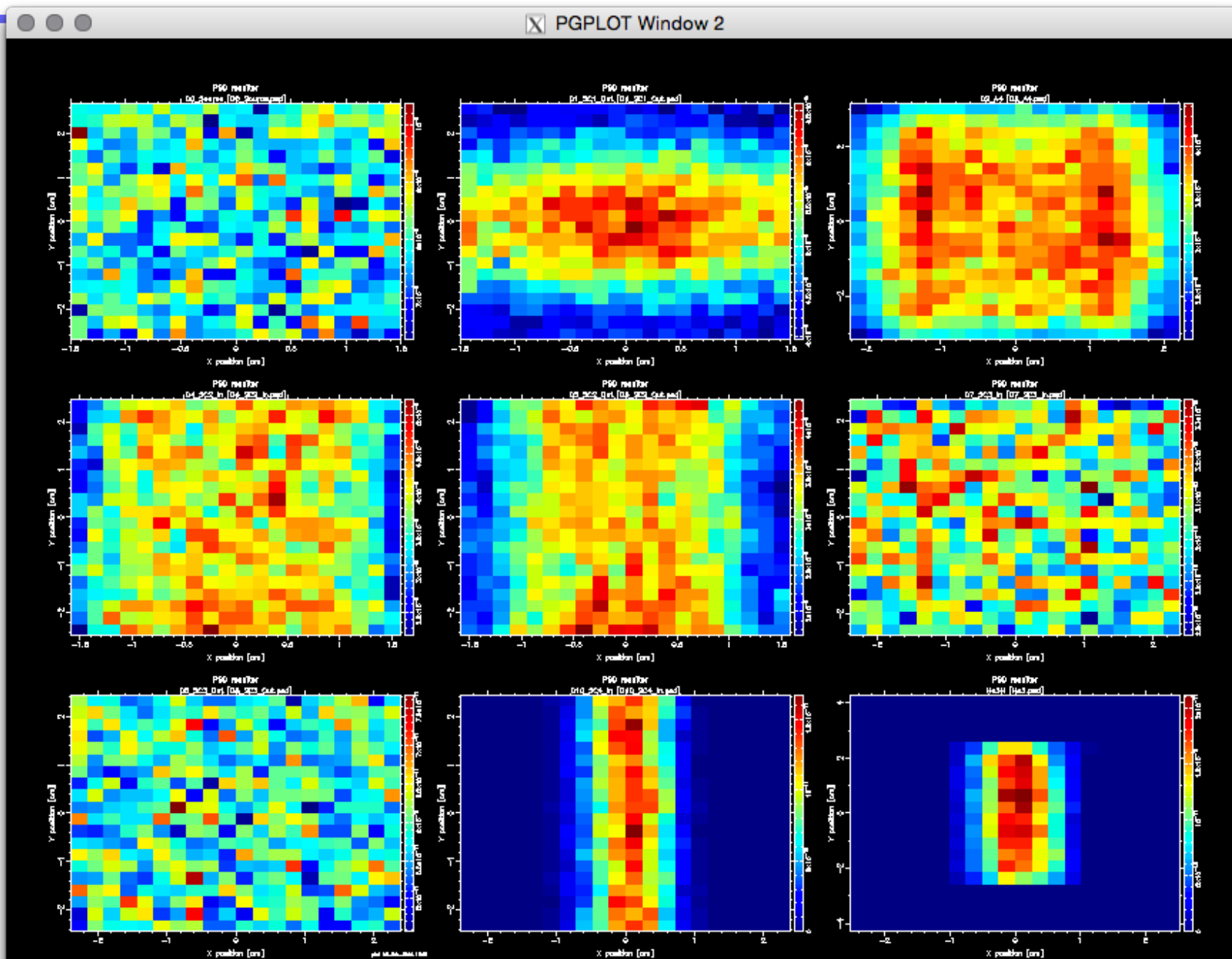
pkwi@pkwi-mbp15:~/tmp$
```

mcplot (--format=PGPLOT)



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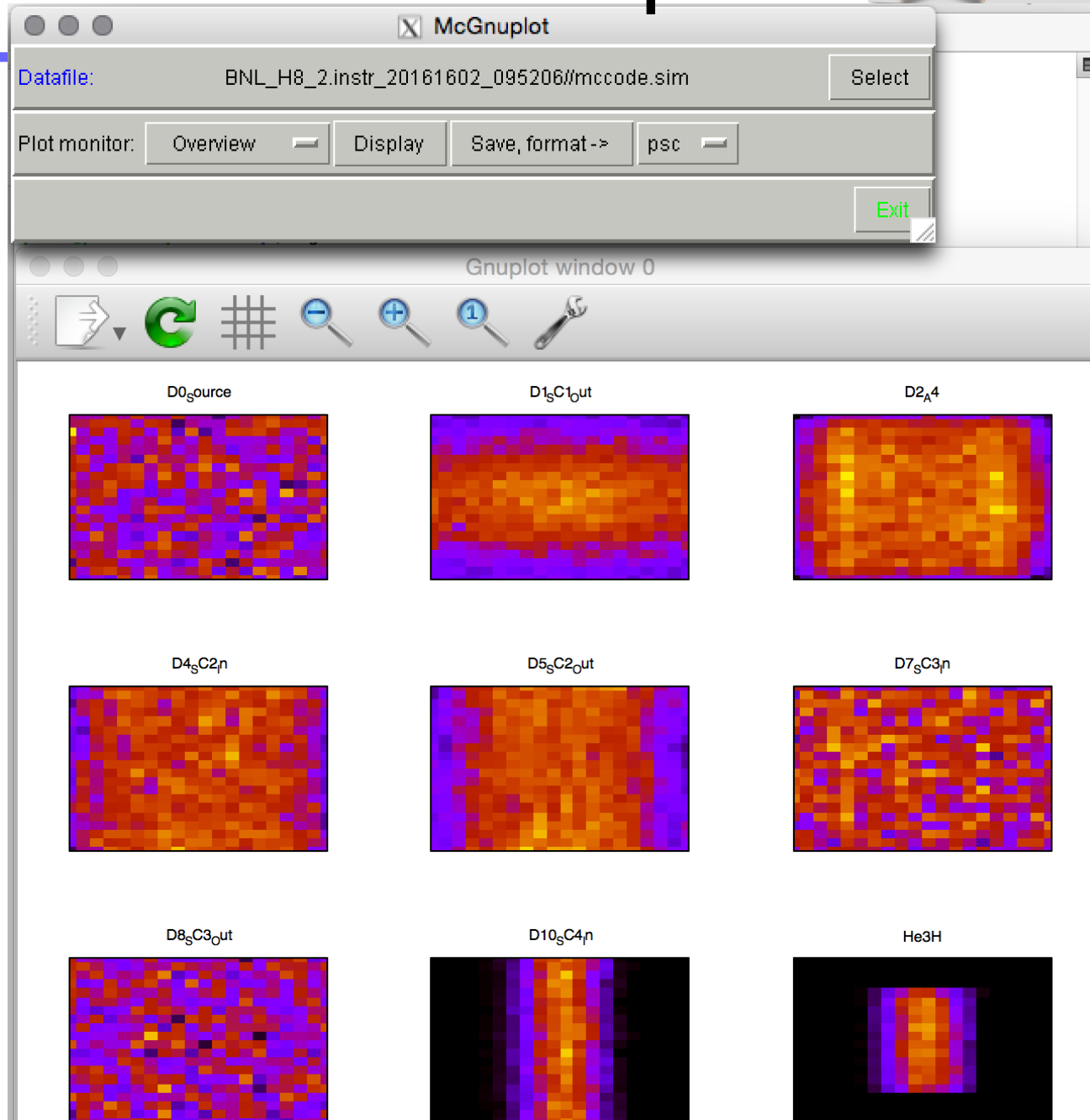


mcplot --format=Gnuplot



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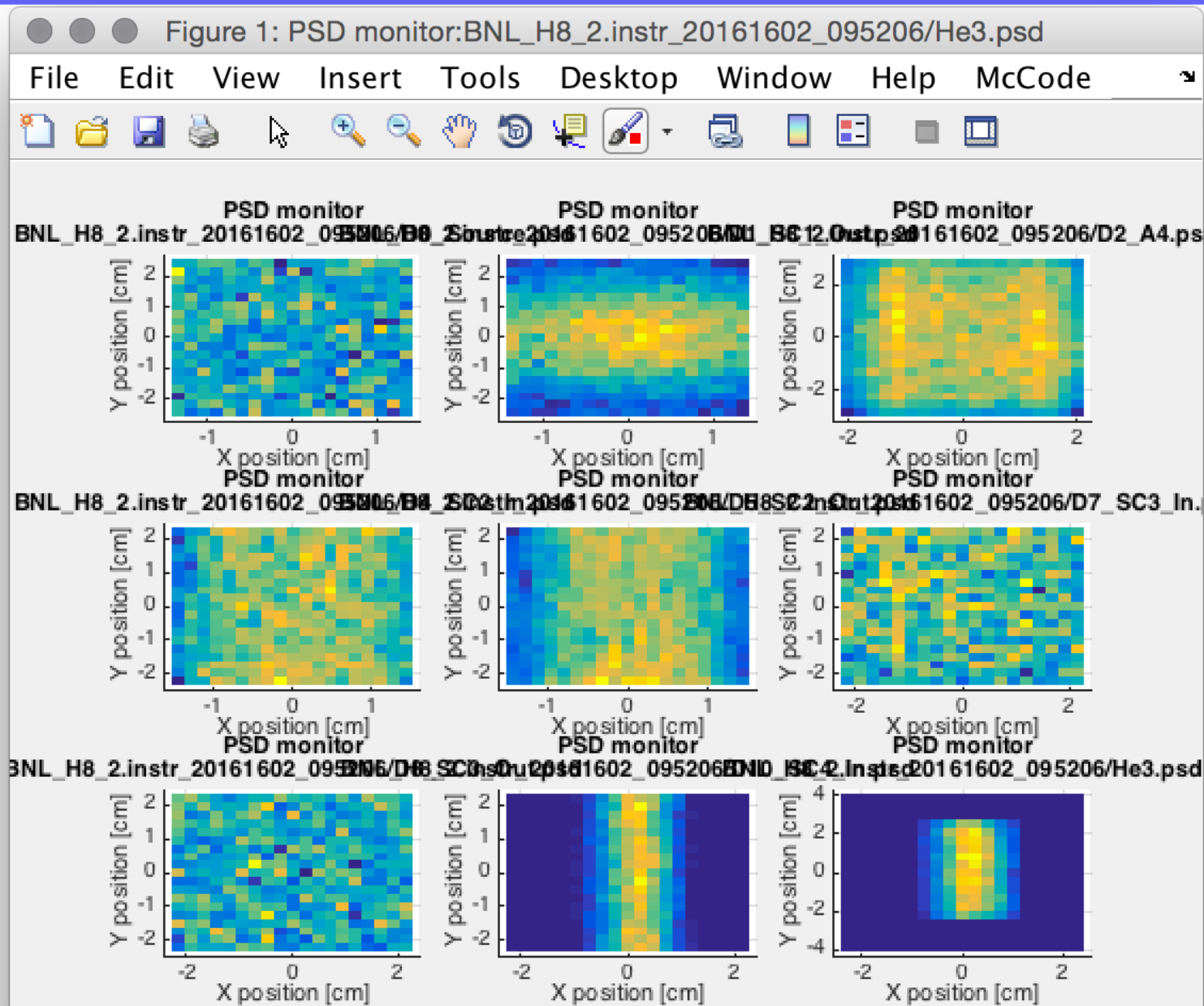


mcplot --format=Matlab



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mcplot-matlab

```

tmp — pkwi@pkwi-mbp15: ~/tmp — MATLAB — 88x50
/usr/local/bin/mcplot: reading local mcstas configuration from /Users/pkwi/.mcstas/mccode_e_config.perl
Click on a plot for full-window view.
Press key for hardcopy (in graphics window), 'Q' to quit
  'P' BW postscript
  'C' color postscript
  'N' PNG file
  'M' PPM file
  'G' GIF file
  'L' Toggle log10 plotting mode
  'T' Toggle contour plotting mode
  'Q' quit
^C
pkwi@pkwi-mbp15:~/tmp$ mcplot-mat BNL_H8_2.instr_20161602_095206/
mcplot-matlab          mcplot-matplotlib-py
pkwi@pkwi-mbp15:~/tmp$ mcplot-mat BNL_H8_2.instr_20161602_095206/
mcplot-matlab          mcplot-matplotlib-py
pkwi@pkwi-mbp15:~/tmp$ mcplot-matlab BNL_H8_2.instr_20161602_095206/

      < M A T L A B (R) >
      Copyright 1984-2014 The MathWorks, Inc.
      R2014b (8.4.0.150421) 64-bit (maci64)
      September 15, 2014

To get started, type one of these: helpwin, helpdesk, or demo.
For product information, visit www.mathworks.com.

Loading BNL_H8_2.instr_20161602_095206/mccode.sim (McCode simulation)
Loading BNL_H8_2.instr_20161602_095206/D0_Source.psd (McCode format)
Loading BNL_H8_2.instr_20161602_095206/D1_SC1_Out.psd (McCode format)
Loading BNL_H8_2.instr_20161602_095206/D2_A4.psd (McCode format)
Loading BNL_H8_2.instr_20161602_095206/D4_SC2_In.psd (McCode format)
Loading BNL_H8_2.instr_20161602_095206/D5_SC2_Out.psd (McCode format)
Loading BNL_H8_2.instr_20161602_095206/D7_SC3_In.psd (McCode format)
Loading BNL_H8_2.instr_20161602_095206/D8_SC3_Out.psd (McCode format)
Loading BNL_H8_2.instr_20161602_095206/D10_SC4_In.psd (McCode format)
Loading BNL_H8_2.instr_20161602_095206/He3.psd (McCode format)

ans =

Columns 1 through 5

    [1x1 struct]    [1x1 struct]    [1x1 struct]    [1x1 struct]    [1x1 struct]

Columns 6 through 9

    [1x1 struct]    [1x1 struct]    [1x1 struct]    [1x1 struct]

>>

```

```

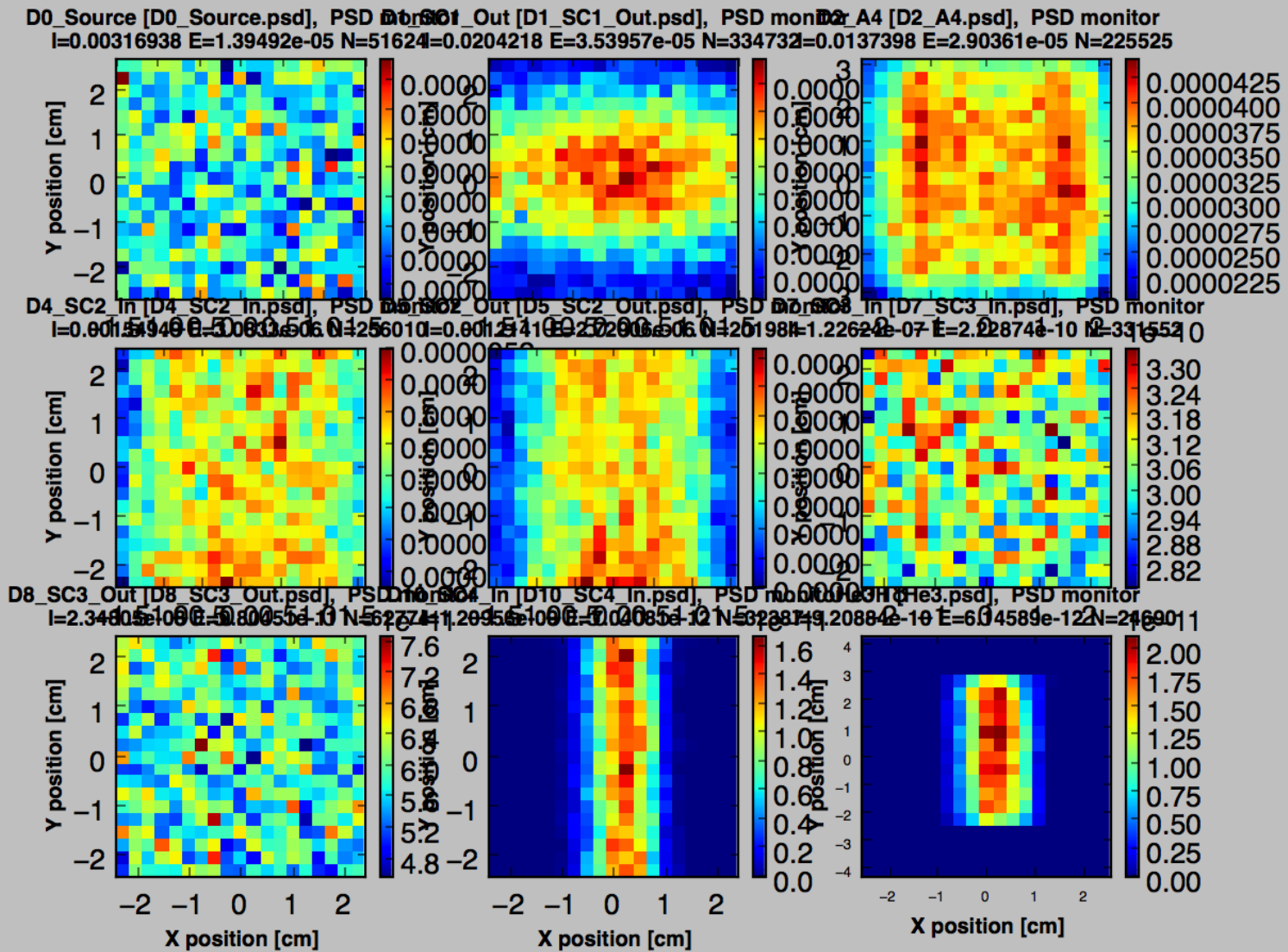
tmp — pkwi@pkwi-mbp15: ~/tmp
pkwi@pkwi-mbp15:~/tmp$ mcrun --help
mcrun: reading local mcstas configuration from /Users/pkwi/.mcstas/mccode_e_config.perl
/usr/local/bin/mcrun: reading local mcstas configuration from /Users/pkwi/.mcstas/mccode_e_config.perl
*** No directory given - placing data in _20160216_095914
"Usage: mcrun [-cpnN] Instr [-sndftgahi] params={val|min|max}
mcrun options:
  -c      --force-compile  Force rebuilding of instrument
  -p FILE  --param=FILE    Read parameters from file FILE
  -n COUNT --ncount=COUNT Set number of neutrons to simulate
  -N NP    --numpoints=NP  Set number of scan points.
                        --grid=NB_CPU  Spawn simulations to multiple CPUs
                        --multi=NB_CPU see the documentation for
                        --mpi=NB_CPU   Spread simulation over NB_CPU machines
  --machines=MACHINES Read machine names from file MACHINES
  --save=SAVE Save simulation or data to file SAVE

```

Figure 1: PSD monitor:BNL_H8_2.instr_20161602_095206/He3.psd

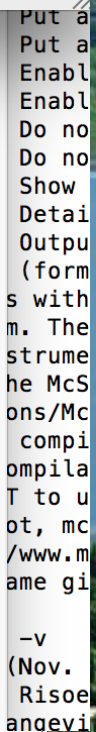
The figure displays nine individual PSD monitor plots arranged in a 3x3 grid. Each plot is titled 'PSD monitor' and shows a 2D map of neutron intensity. The x-axis is labeled 'X position [cm]' and the y-axis is labeled 'Y position [cm]'. The plots show different intensity distributions, with some having a central bright spot and others showing more diffuse patterns. The plots are labeled with their respective file names: BNL_H8_2.instr_20161602_095206/D0_Source.psd, BNL_H8_2.instr_20161602_095206/D1_SC1_Out.psd, BNL_H8_2.instr_20161602_095206/D2_A4.psd, BNL_H8_2.instr_20161602_095206/D4_SC2_In.psd, BNL_H8_2.instr_20161602_095206/D5_SC2_Out.psd, BNL_H8_2.instr_20161602_095206/D7_SC3_In.psd, BNL_H8_2.instr_20161602_095206/D8_SC3_Out.psd, BNL_H8_2.instr_20161602_095206/D10_SC4_In.psd, and BNL_H8_2.instr_20161602_095206/He3.psd.

Figure 1

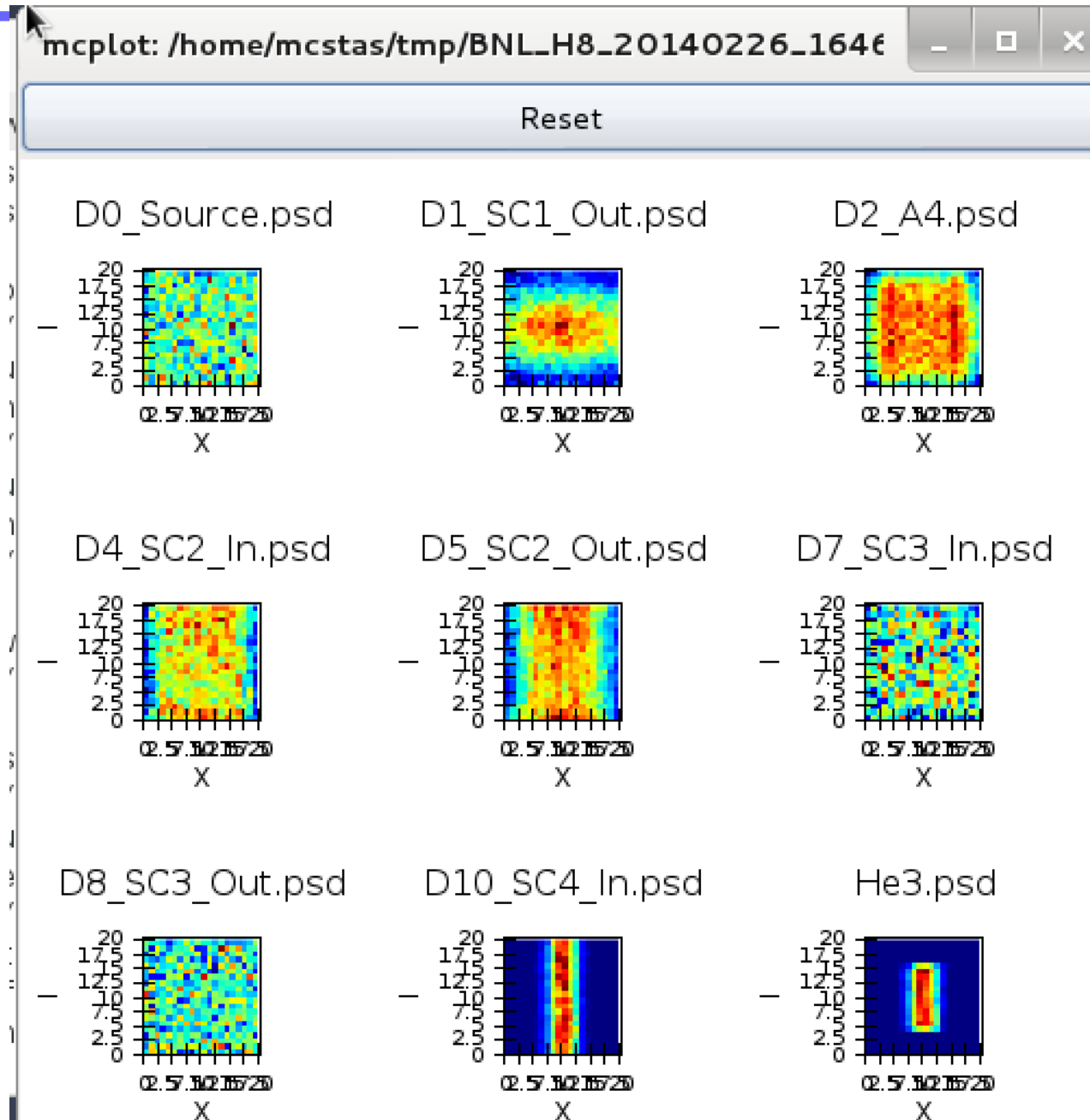


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mcplot-chaco-py



mcdisplay

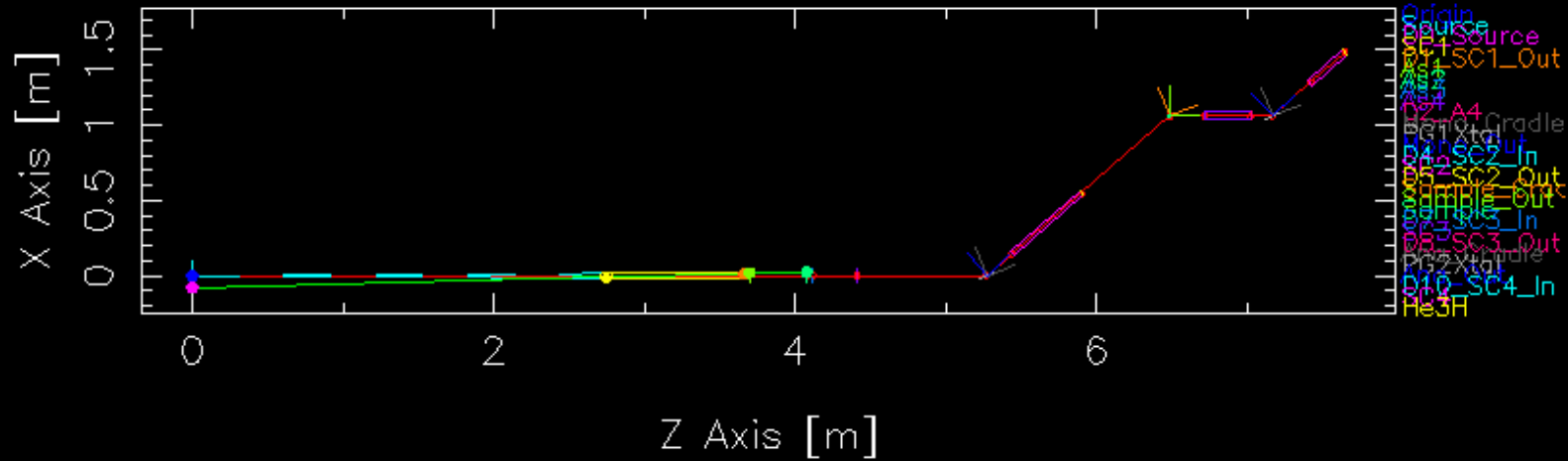


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PGPLOT Window 1

Z-X view: BNL_H8_2.out



INSTITUT

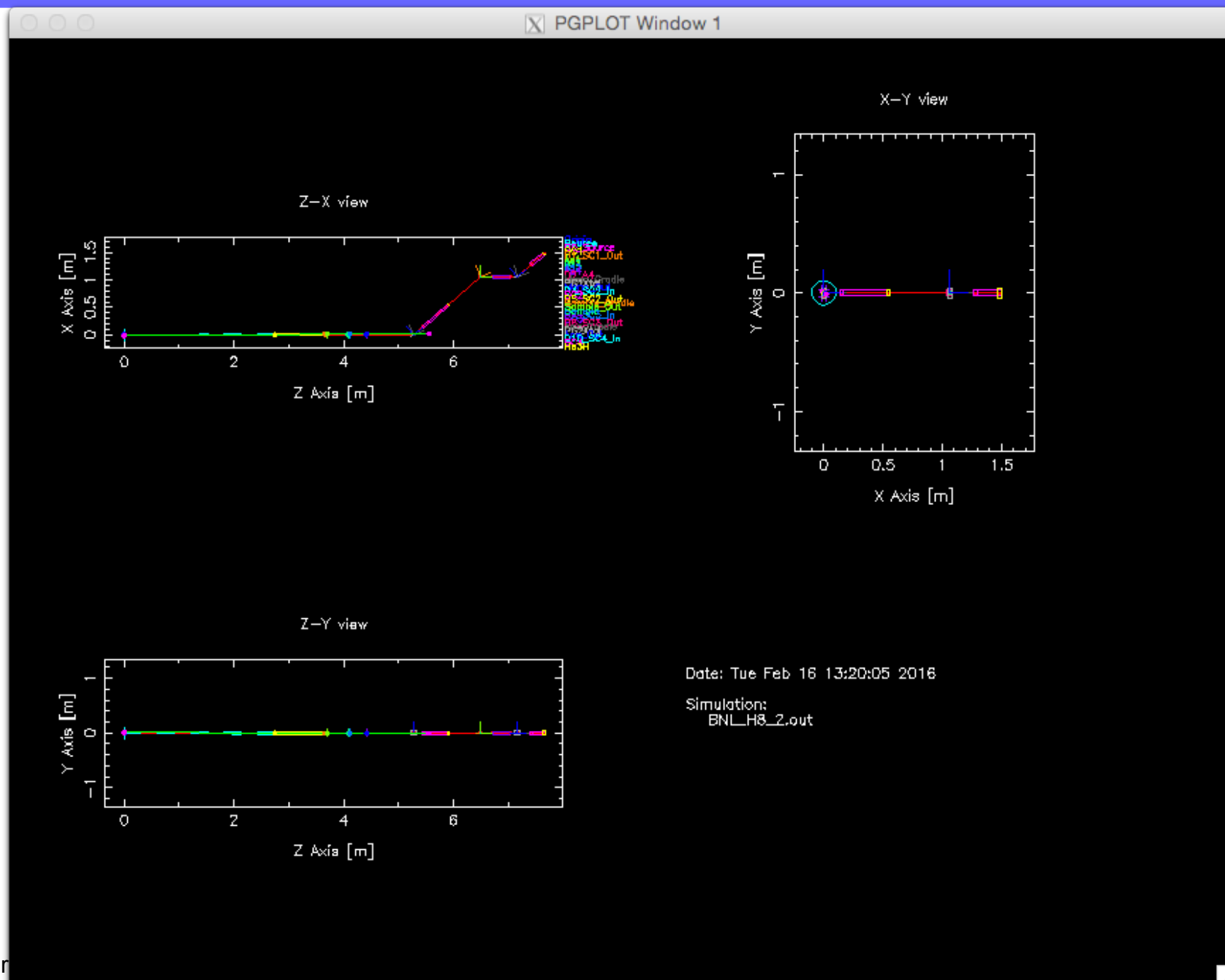


mcdisplay -m



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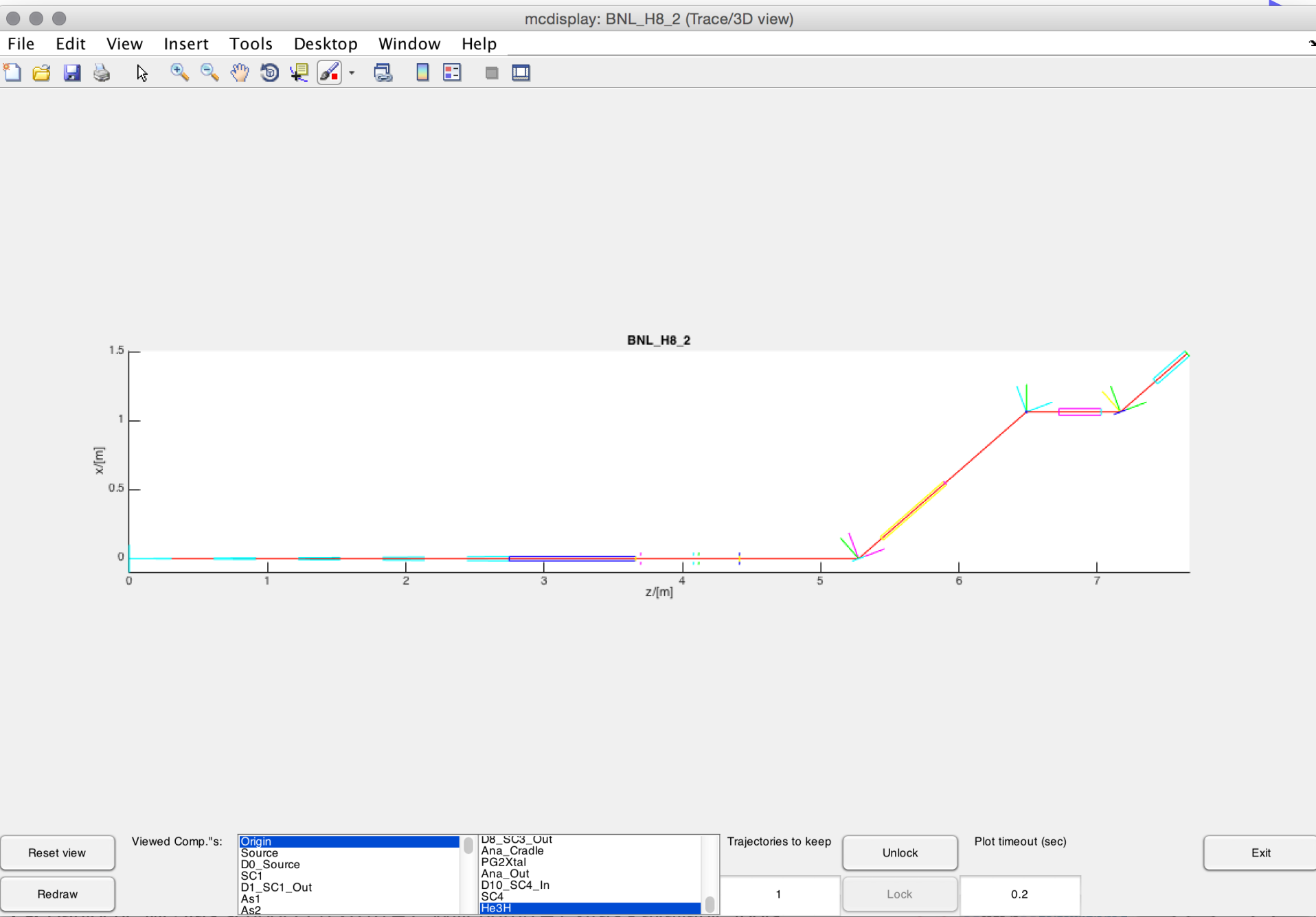
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INSTITUT



mcdisplay --format=Matlab

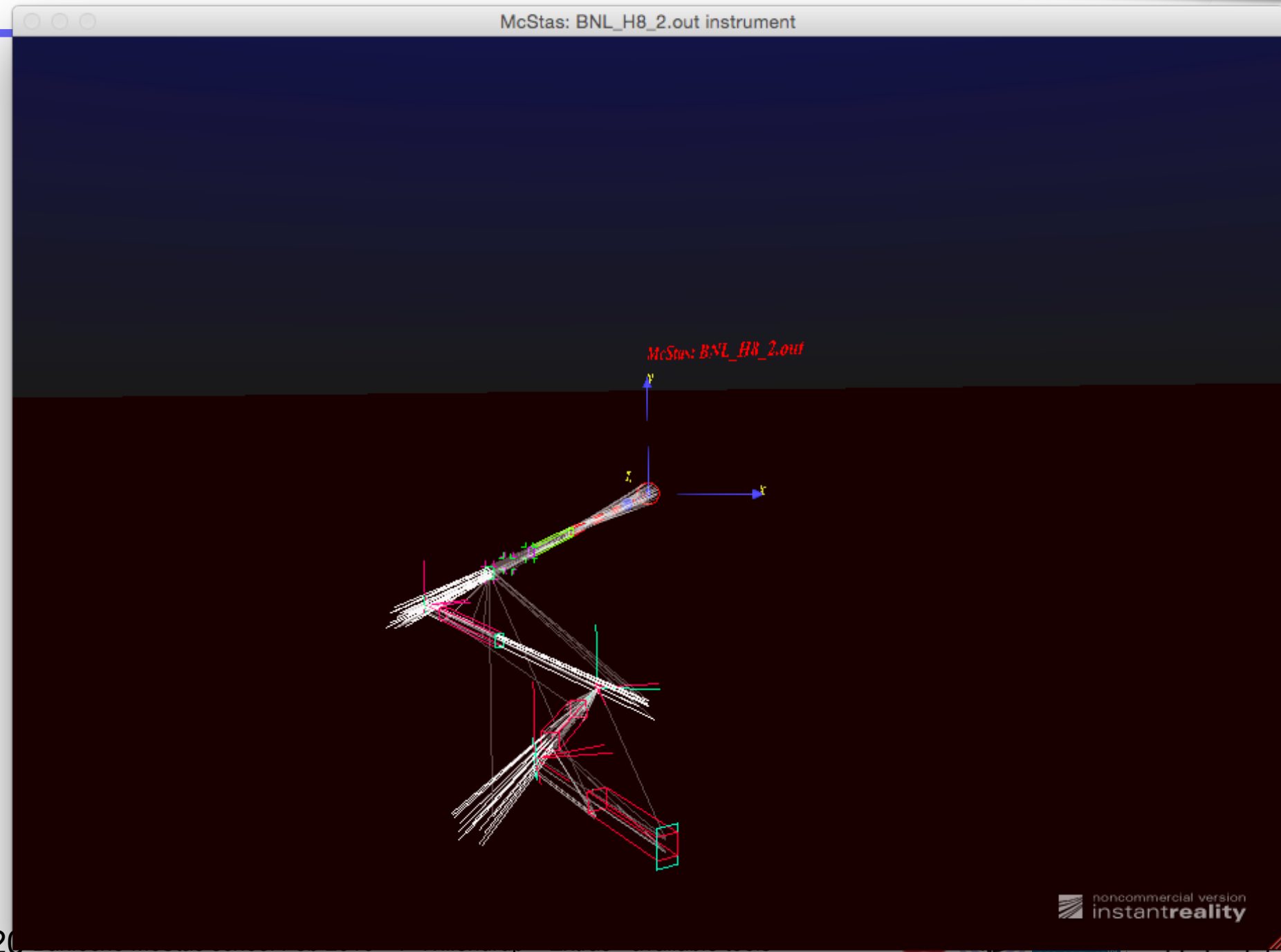


mcdisplay --format=VRML



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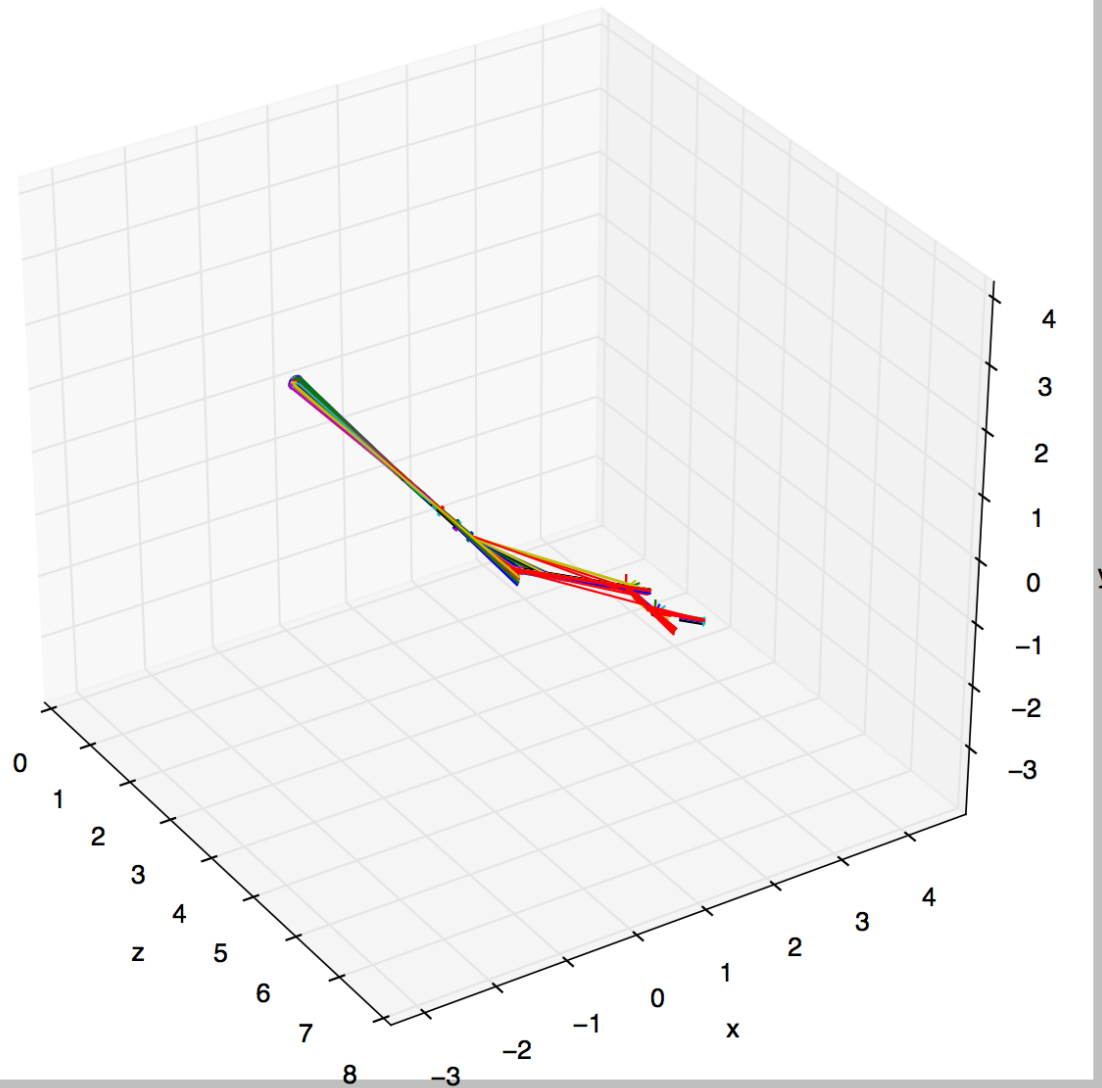


mcdisplay-matplotlib-py



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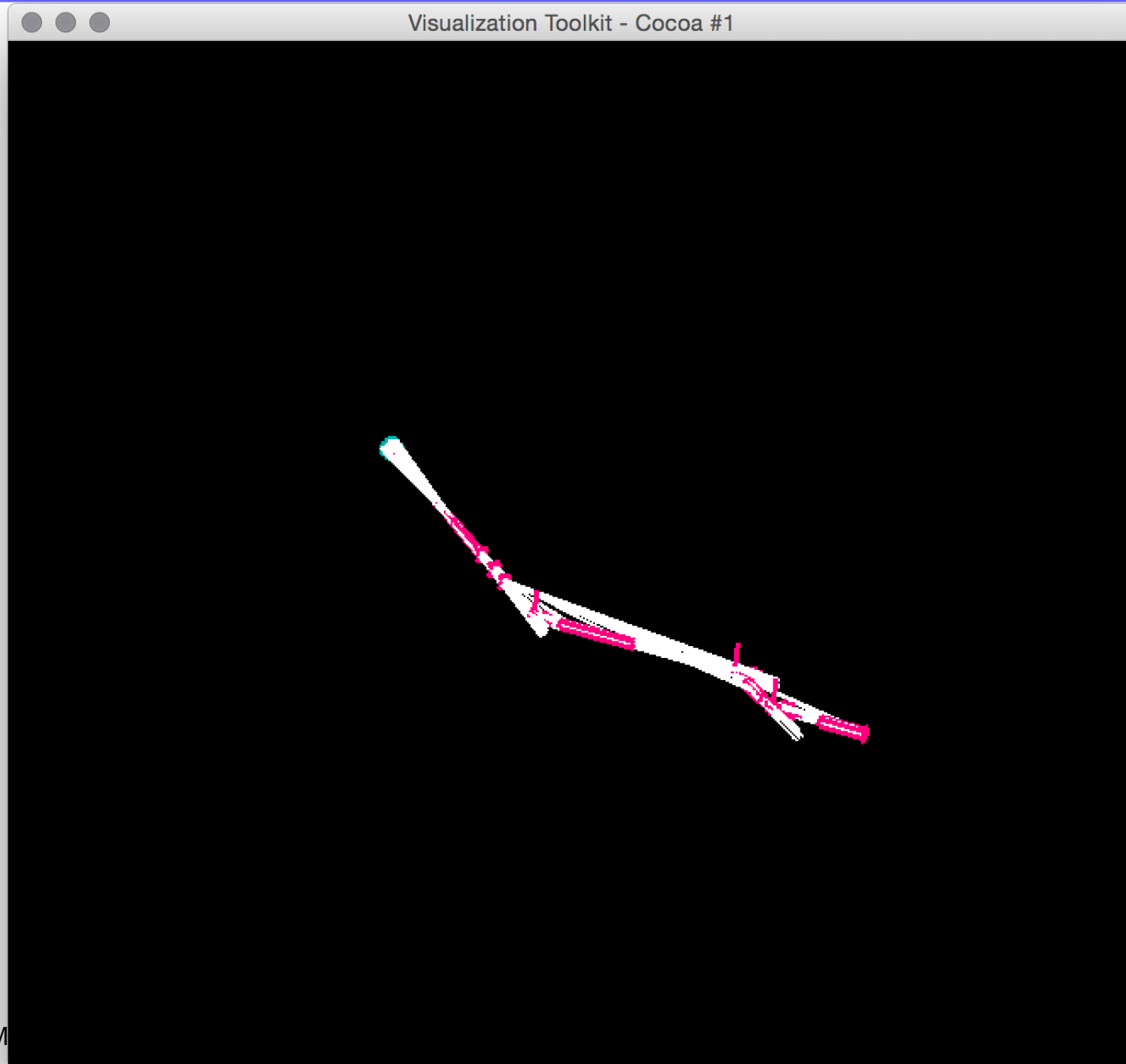
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mcdisplay-vtk-py



mcdisplay-x3d-py

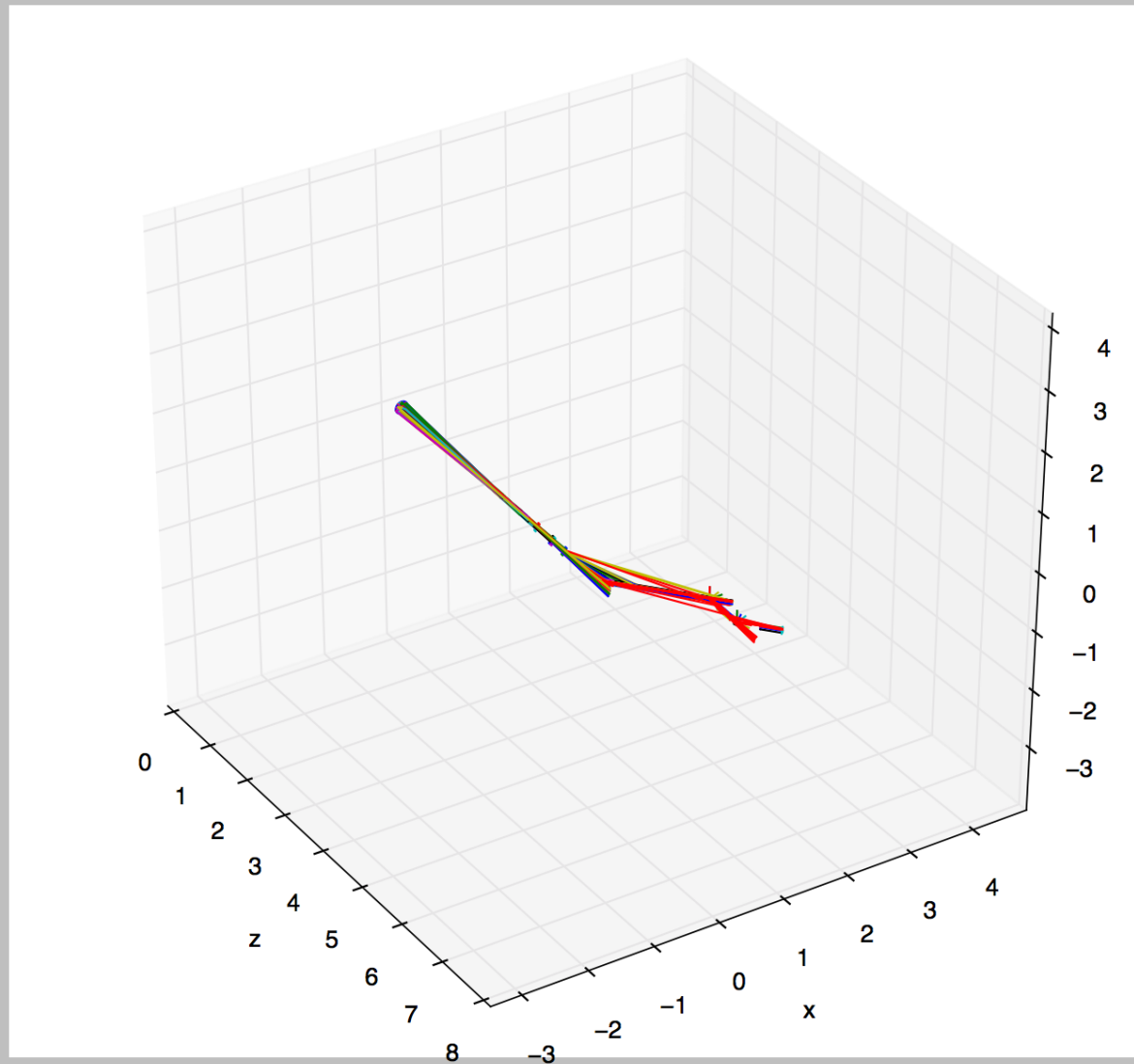


mcdisplay --format=VRML



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Web interface @ e-neutrons.org

sim.e-neutrons.org

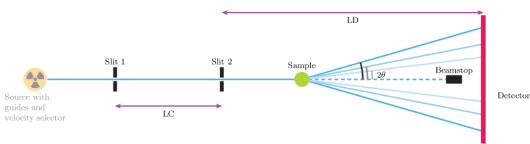
Apple Remote ... (kickstart) SpinW Software for...el Computers Studerende sø...| Dikatal.dk Bachmann N ...4896 | eBay Bachmann Tra...uct Catalog

Instrument

McStas

Logged in as pwillendrup (see recent simruns) Logout

SANSSimple (click for documentation)



Parameters for SANSSimple

pinhole_rad [m] :	0.004	radius of the collimating pinholes (0.004)
LC [m] :	3	length of the collimator – distance between pinholes (3)
LD [m] :	3	distance between the last pinhole slit and detector (3)
Lambda [Angs] :	6	Average wavelength traced from source (6)
DLambda [Angs] :	0.6	Wavelength band +/- traced from source (0.6)
R [AA] :	400	radius of the hard, monodisperse spheres in the sample (400)
dR [AA] :	0	Normal variance of Radius (0)
PHI [1] :	0.01	Volume fraction of the hard, monodisperse spheres in the sample (0.01)
Delta_Rho [fm/AA^3] :	0.6	Volume specific scattering length density contrast of the hard, monodisperse spheres in the sample as compared to the solution (0.6)
Qmax [AA^-1] :	0.3	Maximum scattering vector allowed by geometry to hit the detector area (0.3)
BEAMSTOP [0/1] :	1	If set, the beamstop is inserted in front of the detector in order to block the transmitted beam (1)
SAMPLE [0/1] :	1	If set, a sample of spheres or spherical shells is inserted (1)

Runtime configuration

neutron rays:	1000000
simulation steps:	1
random seed:	0

Start simulation run

A web-based interface for **McStas**.

All contents is provided under the terms of



sim.e-neutrons.org

Apple Remote ... (kickstart) SpinW Software for...el Computers Studerende sø...| Dikatal.dk Bachmann N ...4896 | eBay Bachmann Tra...uct Catalog

Simulation Data

SANSSimple

Completed 15:57:50, 16/12-2015

Reconfigure

Simulation

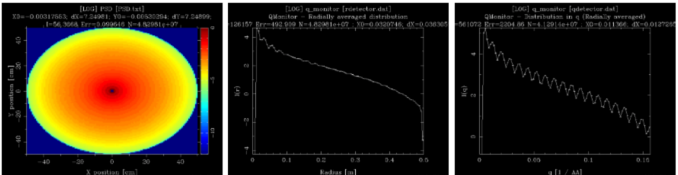
params: pinhole_rad=0.004 LC=3 Lambda=6 DLambda=0.6 R=400 dR=0 dbilayer=35 PHI=0.01 Delta_Rho=0.6 Qmax=0.3 BEAMSTOP=1 SAMPLE=1

neutron rays: 10000000

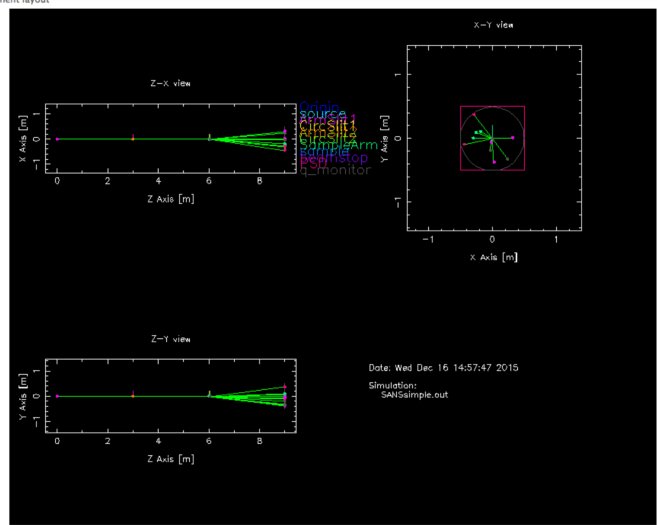
random seed: 0

simulation steps: 1

Data plots (click here for lin-scale)



Instrument layout



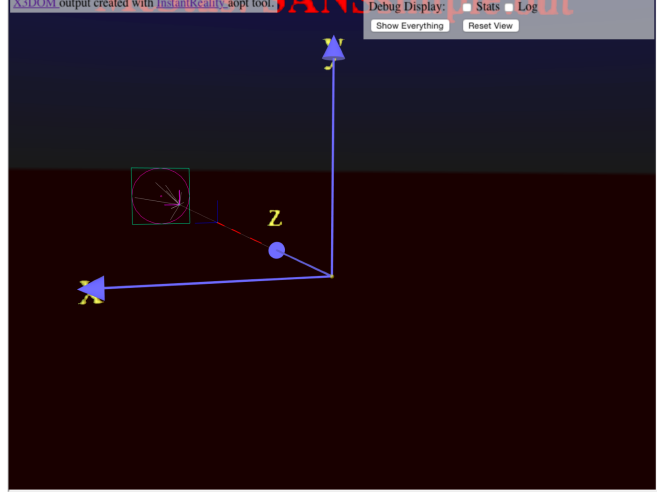
Navigation Mode: Examine

Debug Display: Stats Log

Show Everything Reset View

McStas SANSSimple

3D DOM output created with InstantReality.aapt tool.



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Instrument

McStas

Logged in as pwillendrup (see recent simruns) Logout

SANSSimple (click for documentation)

Parameters for SANSSimple

pinhole_rad [m] : 0.004

LC [m] : 3

LD [m] : 3

Lambda [Angs] : 6

DLambda [Angs] : 0.6

R [AA] : 400

dR [AA] : 0

PHI [1] : 0.01

Delta_Rho [fm/AA^3] : 0.6

Qmax [AA^-1] : 0.3

BEAMSTOP [0/1] : 1

SAMPLE [0/1] : 1

radius of the collimating pinholes (0.004)

length of the collimating slits (3)

distance between the collimating slits (3)

Average wavelength (6)

Wavelength spread (0.6)

radius of the hard, monodisperse spheres in the sample (400)

Normal variance of Radius (0)

Volume fraction of the hard, monodisperse spheres in the sample (0.01)

Volume specific scattering length density contrast of the hard, monodisperse spheres in the sample as compared to the solution (0.6)

Maximum scattering vector allowed by geometry to hit the detector area (0.3)

If set, the beamstop is inserted in front of the detector in order to block the transmitted beam (1)

If set, a sample of spheres or spherical shells is inserted (1)

Runtime configuration

neutron rays: 1000000

simulation steps: 1

random seed: 0

Start simulation run

Run

A web-based interface for McStas.

All contents is provided under the terms of

Only pre-defined instruments!!!

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Simulation Data

SANSSimple

Completed 15:57:50, 16/12-2015

Reconfigure

Simulation

params: pinhole_rad=0.004 LC=3 Lambda=6 DLambda=0.6 R=400 dR=0 dbilayer=35 PHI=0.01 Delta_Rho=0.6 Qmax=0.3 BEAMSTOP=1 SAMPLE=1

neutron rays: 10000000

random seed: 0

simulation steps: 1

Data plots (click here for lin-scale)

Instrument layout

Date: Wed Dec 16 14:57:47 2015

Simulation: SANSSimple.out

Navigation Mode: Examine

Debug Display: Stats Log

Show Everything Reset View

McStas SANSSimple

3D visualization of the instrument layout and simulation results. It shows the beam path through the slits and sample, and the resulting scattering pattern on the detector. The layout is labeled with 'Source', 'Slit 1', 'Slit 2', 'Sample', 'Beamstop', 'q-monitor', and 'Detector'.

Courses

Introduction to Neutron Scattering

Introduction to Neutron Scattering
Open course for blended learning

Muon Spin Spectroscopy
A course on a complementary technique to neutron scattering

INTRODUCTION TO NEUTRON SCATTERING - SELF STUDY

This course contains 10 high-guidance modules on master-level physics.
Each module takes approximately 10-20h to complete.

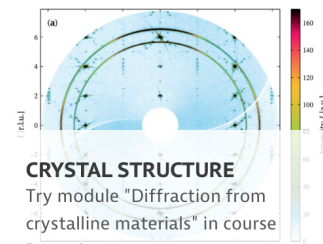
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Science cases

 **Finding crystal structure**
Chemistry of materials

 **Characterising liposomes in suspension**
Life sciences

 **Characterising magnetic order**
Magnetic and electronic phenomena



CRYSTAL STRUCTURE

Try module "Diffraction from crystalline materials" in course "Introduction to Neutron Scattering"

[READ MORE](#)

Exercise taster

Problem Discussion Read View source View history Go Search

Problem: Fourier transform

Mathematically the scattering amplitude is the Fourier transform of the distribution of scattering centers (i.e., electrons, atoms) within the material. The scattered intensity (the scattering function) is the square of the scattering amplitude.

One-dimensional crystal.

The Fourier transform of a function $p(x)$ is written as

$$F(q) = \int p(r) \exp(iqr) dr,$$

where $p(r)$ is the function in real space given as position r , and q is a coordinate in Fourier space (which in scattering terms usually is called "reciprocal space"). $p(r)$ is not necessarily positive; the positive values represent scattering length density within the sample.

We consider a one-dimensional space, i.e. all particles (scattering centers) are positioned on a line, and correspondingly only calculate the one-dimensional Fourier transform. We assume further that all particles are particles (H₂O = 1).

Contents (Index)

- 1 Question 1
- 2 Question 2
- 3 Question 3
- 4 Question 4
- 5 Question 5

FOURIER TRANSFORM

Question 2 Do you know what the scattering intensity is from a string of

Question 3
Calculate the Fermi energy of a 3D free electron gas with a density of 10^{28} m^{-3} .
Hint
Solution

particles? density of a one dimensional crystal with three particles separated with a distance R , and find the normalized interval.

Test yourself here!

Question 4
Calculate the Fourier transform and the scattering intensity of a one dimensional crystal with constant nearest neighbor distance a and scattering vector q .

Hint

Solution

Question 5

READ MORE

FOURIER TRANSFORM

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Quiz taster

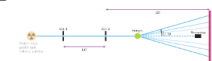
NEUTRON PROPERTIES

Do you know what neutrons are good for and why? Test yourself here ...

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Simulation taster

McStas  Logged in as jpirry ([view recent simulations](#))



errors for SANSingle		
α_{rad} [m]:	0.004	radius of the collimating pinholes (0.004)
l :	3	length of the collimator - distance between pinholes (3)
l :	3	distance between the last pinhole slit and detector (3)

SMALL ANGLE SCATTERING

Do you know what the scattering pattern looks like from small

particles in solution?
Test yourself here...

SMALL ANGLE SCATTERING

Do you know what the scattering pattern looks like from small particles in solution?

Test yourself here...

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CRYSTAL STRUCTURE

Exercise taster

Problem: Fourier transform
Mathematically the scattering amplitude is the Fourier transform of the distribution of scattering centers in the sample. The scattered intensity (the scattering function) is the square of the scattering amplitude.
The Fourier transform of a function $f(x)$ is written as:
$$F(g) = \int_{-\infty}^{\infty} f(x) e^{-i2\pi gx} dx$$

where $f(x)$ is the function in real space given by positions x , and g is a coordinate in Fourier space (which is scattering terms usually is called "reciprocal space"). $f(x)$ is called a scattering density. The position vector x is written in Cartesian coordinates. We will consider a one-dimensional space, i.e. all particles (scattering centers) are positioned on a line, and correspondingly only calculate the one-dimensional Fourier transform. We discuss further that all particles are parallel (size = 1).
Contents (1/1)
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7 Question 7
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9 Question 9
10 Question 10
FOURIER TRANSFORM
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- ns-intro-selfstudy="Introduction to neutron scattering – self study"
- musr="Introduction to muon spin resonance"

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Email:

Requested username:

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☐ intro-ns

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McStas

McStas School
Bariloche - Argentina

15th-19th
FEBRUARY
2016

INSTITUT

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