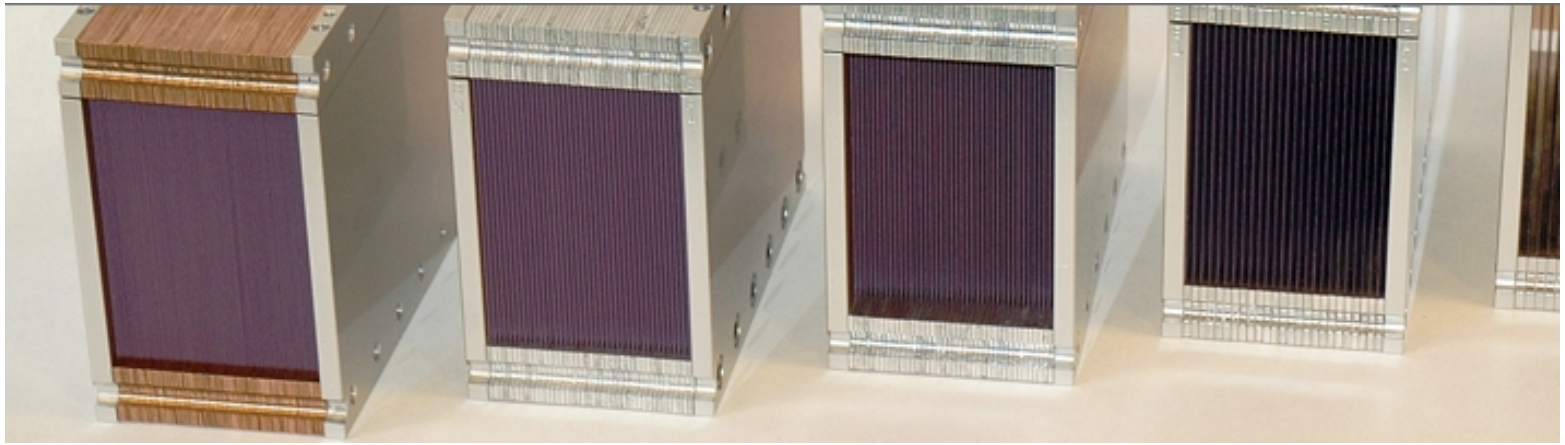
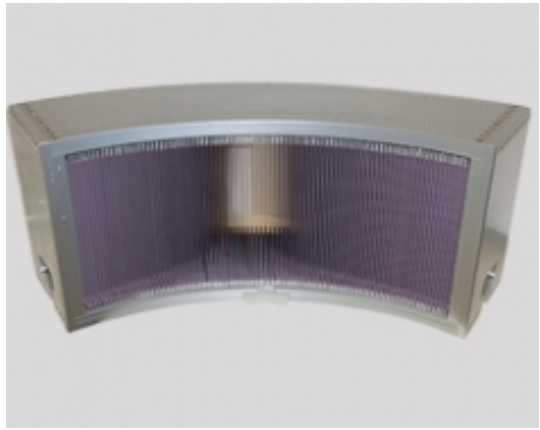
STATIONARY BEAM TAILORING (slits and collimators)





collimator photos from :

http://www.jjxray.dk

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STATIONARY BEAM TAILORING (slits and collimators)

中国散裂中子源

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<u>In this session:</u>

- Overview of existing Slit and Collimator components
- Detailed description of the most commonly used ones
- How to ‘call’ them into a *.instr file
- Practical Exercise using Collimators

STATIONARY BEAM TAILORING (slits and collimators)

Slit (and slit-like) components:

- Slit.comp
- Diaphragm.comp (identical to Slit)
- Beamstop.comp

- (CavitiesIn.comp, CavitiesOut.comp)

Collimators:

- Collimator_linear.comp
- Collimator_radial.comp
- Collimator_ROC.comp
- Exact_radial_coll.comp

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SLITS

Slit.comp

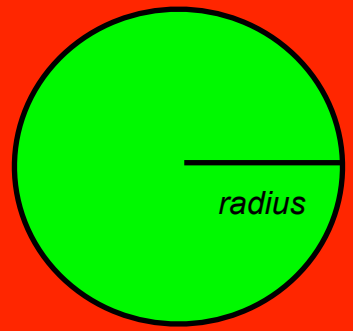
A beam defining diaphragm

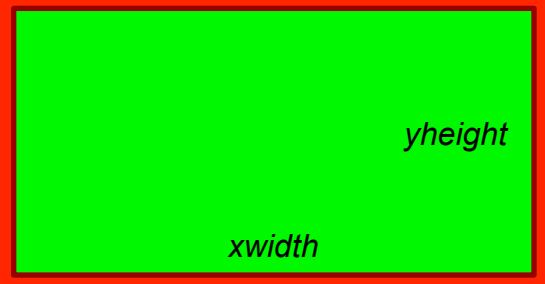
Parameters in **boldface** are required; the others are optional.

Name	Unit	Description	Default
xmin	m	Lower x bound	-0.01
xmax	m	Upper x bound	0.01
ymin	m	Lower y bound	-0.01
ymax	m	Upper y bound	0.01
radius	m	Radius of slit in the z=0 plane, centered at Origo	0
cut	1	Lower limit for allowed weight	0
xwidth	m	Width of slit. Overrides xmin,xmax.	0
yheight	m	Height of slit. Overrides ymin,ymax.	0

Example:

```
COMPONENT input_slit = Slit(xmin=-0.01, xmax=0.01, ymin=-0.01,
                            ymax=0.01)
```


radius


yheight
xwidth

BEAMSTOP

Beamstop.comp

A neutron absorbing area

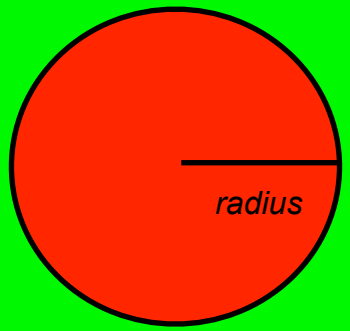
Parameters in **boldface** are required; the others are optional.

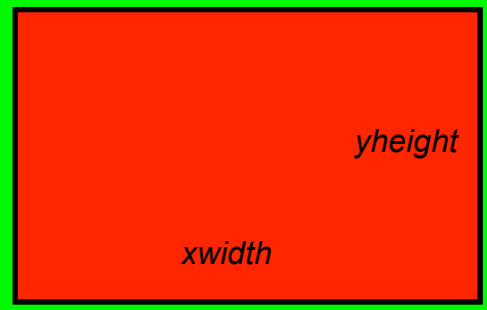
Name	Unit	Description	Default
xmin	m	Lower x bound	-0.05
xmax	m	Upper x bound	0.05
ymin	m	Lower y bound	-0.05
ymax	m	Upper y bound	0.05
xwidth	m	Width of beamstop (x). Overrides xmin,xmax.	0
yheight	m	Height of beamstop (y). Overrides ymin,ymax.	0
radius	m	radius of the beam stop in the z=0 plane, centered at Origo	0

Example:

```
COMPONENT stopbeam = Beamstop(xmin=-0.01, xmax=0.01, ymin=-0.01,
                              ymax=0.01)
```

```
COMPONENT stopbeam = Beamstop(radius=0.01)
```





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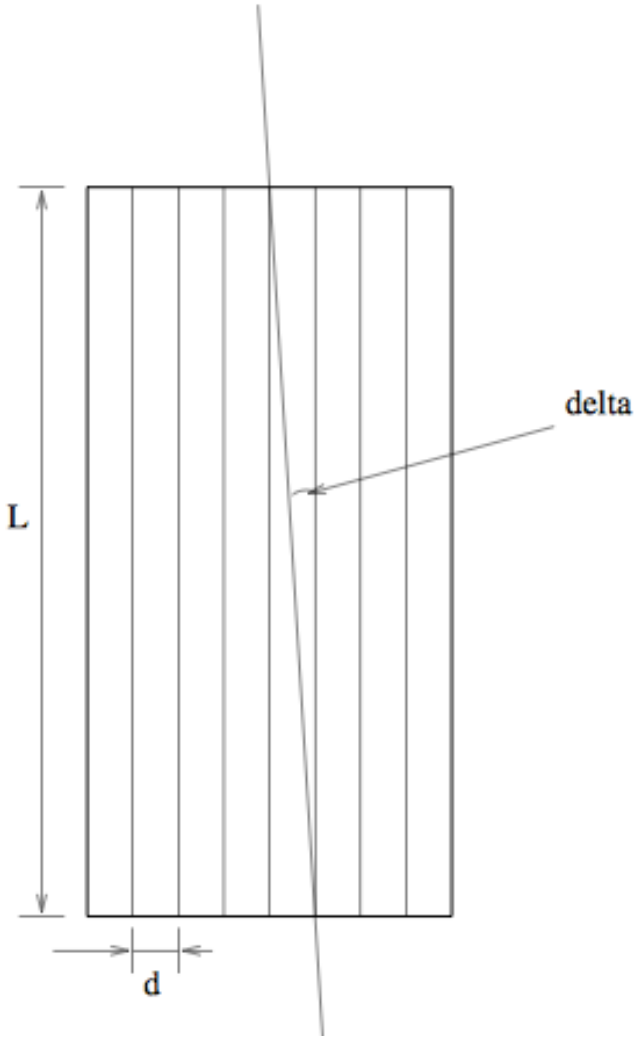
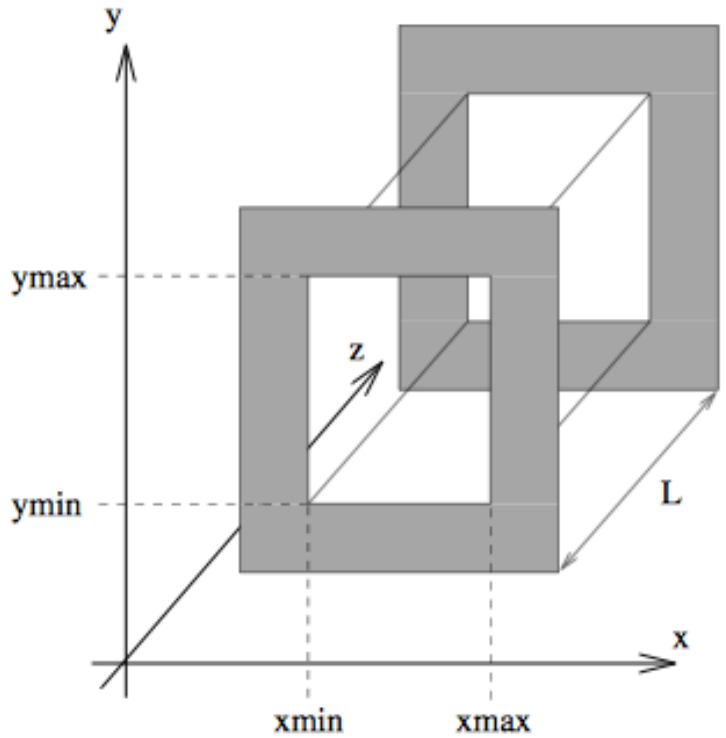
COLLIMATORS

Collimator_linear.comp

A simple Soller blade collimator





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COLLIMATORS

Collimator_linear.comp

A simple Soller blade collimator

Parameters in **boldface** are required; the others are optional.

Name	Unit	Description	Default
xmin	m	Lower x bound on slits	-0.02
xmax	m	Upper x bound on slits	0.02
ymin	m	Lower y bound on slits	-0.05
ymax	m	Upper y bound on slits	0.05
xwidth	m	Width of slits	0
yheight	m	Height of slits	0
length	m	Distance between input and output slits	0.3
divergence	minutes of arc	Divergence horizontal angle (calculated as atan(d/length), where d is the blade spacing)	40
transmission	1	Transmission of Soller (0<=t<=1)	1
divergenceV	minutes of arc	Divergence vertical angle	0

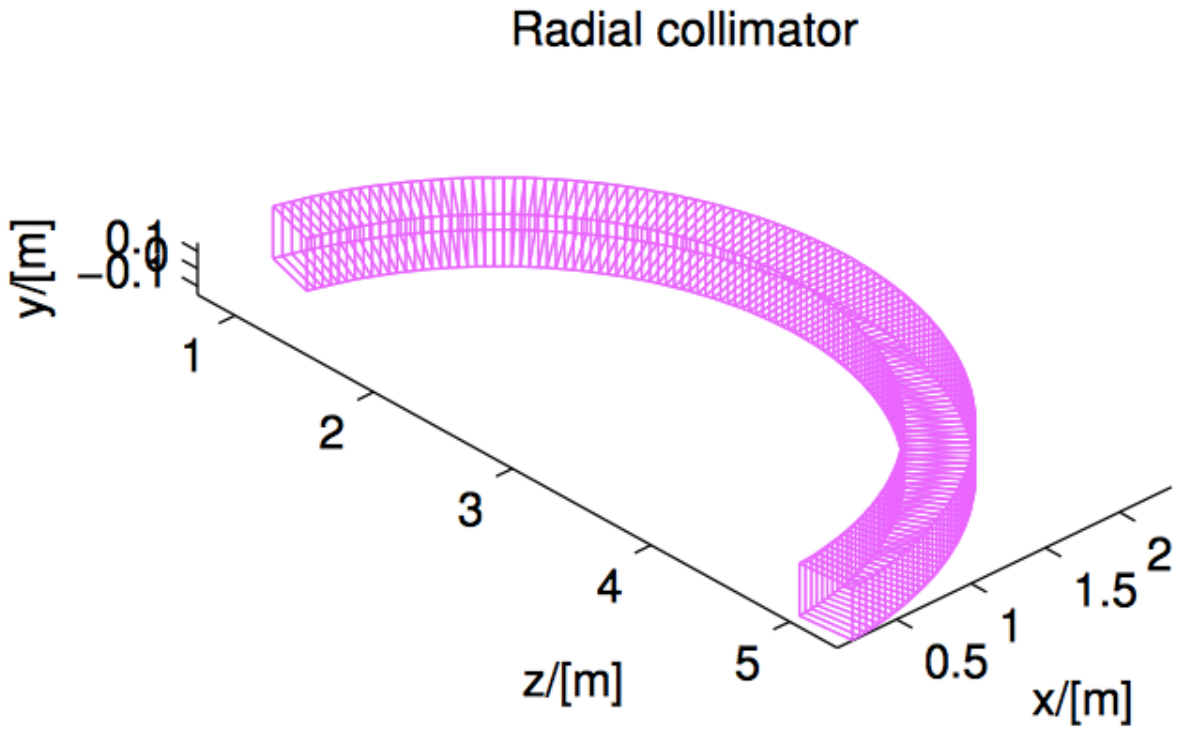
Example:

```
COMPONENT lin_coll = Collimator_linear(xmin=-0.1, xmax=0.1, ymin=-0.1,
                                       ymax=0.1,length=0.25,
                                       divergence=40,transmission=0.7)
```

COLLIMATORS

Collimator_radial.comp

A radial Soller blade collimator



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COLLIMATORS

Collimator_radial.comp

A radial Soller blade collimator

Parameters in **boldface** are required; the others are optional.

Name	Unit	Description	Default
xwidth	m	Soller window width, filled with nslit slits. Use 0 value for continuous collimator.	0
yheight	m	Collimator height.	.3
length	m	Length/Distance between inner and outer slits.	.35
divergence	min of arc	Divergence angle. May also be specified with the nslit parameter. A zero value unactivates component.	0
transmission	1	Maximum transmission of Soller (0<=t<=1).	1
theta_min	deg	Minimum Theta angle for the radial setting.	5
theta_max	deg	Maximum Theta angle for the radial setting.	165
nchan	1	Number of Soller channels in the theta range. Use 0 value for continuous collimator.	0
radius	m	Radius of the collimator (to entry window).	1.3
nslit	1	Number of blades composing each Soller. Overrides the divergence parameter.	0
roc	deg	Amplitude of oscillation of collimator. 0=fixed.	0
verbose	0/1	Gives additional information.	0
approx	0/1	Use Soller triangular transmission approximation.	0

Example:

```
COMPONENT rad_coll = Collimator_radial(xwidth=0.015, yheight=0.3,
                                       length=0.35, divergence=40.0, transmission=1,
                                       theta_min=5, theta_max=165, nchan=128, radius=0.9)
```

COLLIMATORS

EXERCISE

- Available on GitHub:
- https://github.com/McStasMcXtrace/Schools/tree/master/CSNS_March_2019/2_Tuesday_March_26th/1_slits_and_collimators