

# Task 3.1: Powder Sample

1. Use a 'user wavelength distribution file' from a previous task to create a source of 1 cm diameter and bring neutrons of 1.99 – 2.01 Å to a spot of 2 x 2 cm<sup>2</sup> in a distance of 4 m
2. Add a cylindrical sample\_powder (sample: NAC) of 1 cm diameter and 2 cm height in 2 cm distance.
3. Add 'mon2\_div' to visualize Bragg rings

**Edit NAC\_2.pow**

**Sample**

x [cm] 2.0      y [cm] 0.0      z [cm] 0.0

sample geometry cylinder

thickness or radius [cm] 0.5      height [cm] 2.0      width [cm]

structure factor file NAC.str      Browse      BrowseN      Edit

x direction 0.0      y direction 0.0      z direction 1.0

**Scattering**

incoherent scattering [1/cm] 0.01267      total scattering [1/cm] 0.2755      absorption [1/cm] 0.0

unit cell volume [Å<sup>3</sup>] 1079.1

Check      Save+Close      Save As      Cancel

Remove neutrons that are not scattered

**sample\_powder module 2**

sample file NAC\_2.pow      Browse      BrowseN      Edit

Theta [deg]      dTheta [deg]      Phi [deg]

dPhi [deg]      repetitions 1      colour 2

incoherent scattering no      treat all neutrons no

Done

Restriction of the solid angle into which neutrons are scattered

Mark scattered neutrons

## Task 3.1: Detector

1. Add a cylindrical detector of 1 m height and 2 m radius all around the sample
2. Add 'eval\_elast' to see intensity as a function of scattering angle and to determine d-spacings

total length of the detector

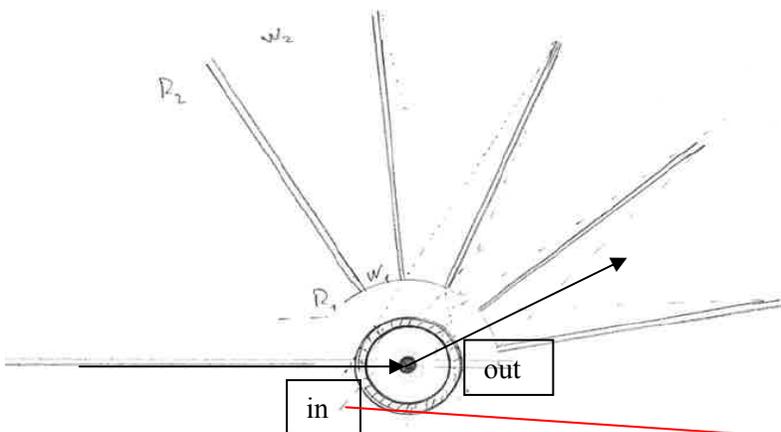
determines size of the detector cells

normal: wavelength dependent detection  
probability + diffusion into neighboring cells

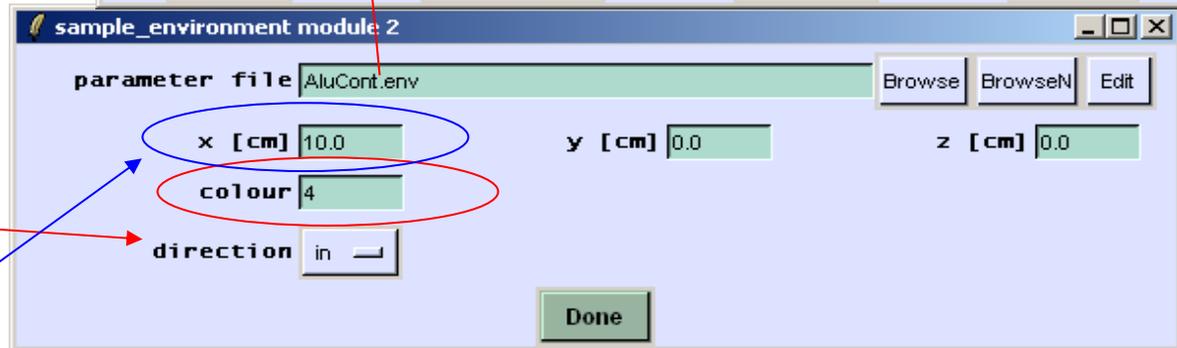
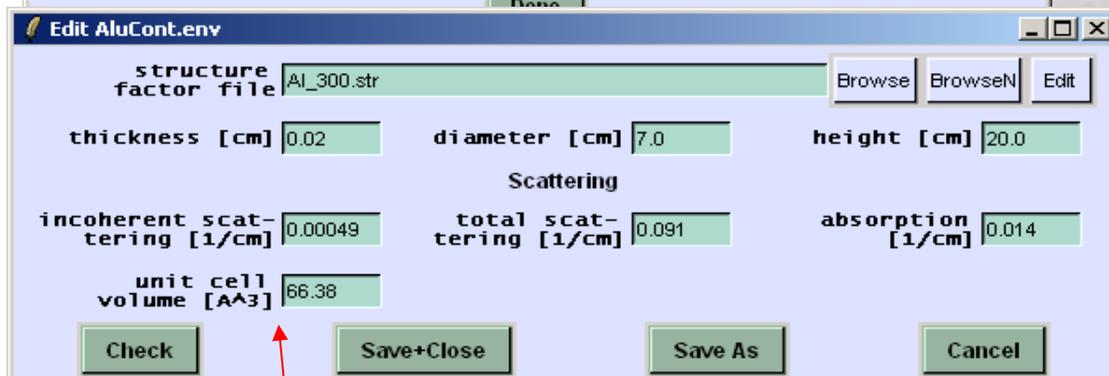
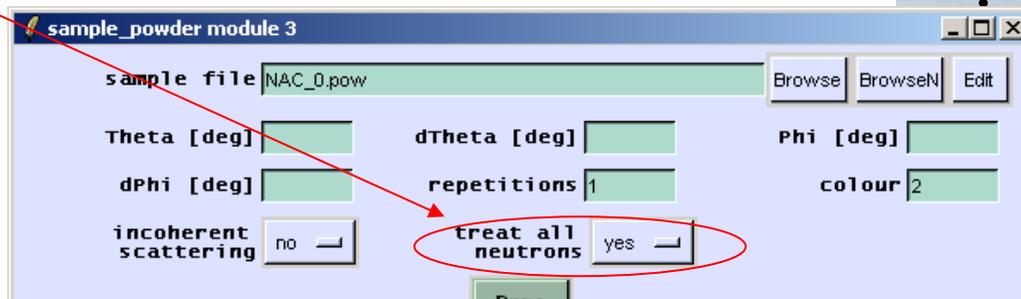
## Task 3.2: Background by Sample Environment

1. Add a concentric aluminum cylinder of 7 cm diameter and 0.2 mm (Alu\_cont.env) thickness around the sample using twice the module 'sample\_environment', now transmitted neutrons must be treated as well
2. Estimate the background by
  - coloring neutrons and
  - checking the log file and/or separating the contributions using eval\_elast

(some trajectories are not treated properly, bug will be fixed in the next version)



Stop beam in front of the sample environment



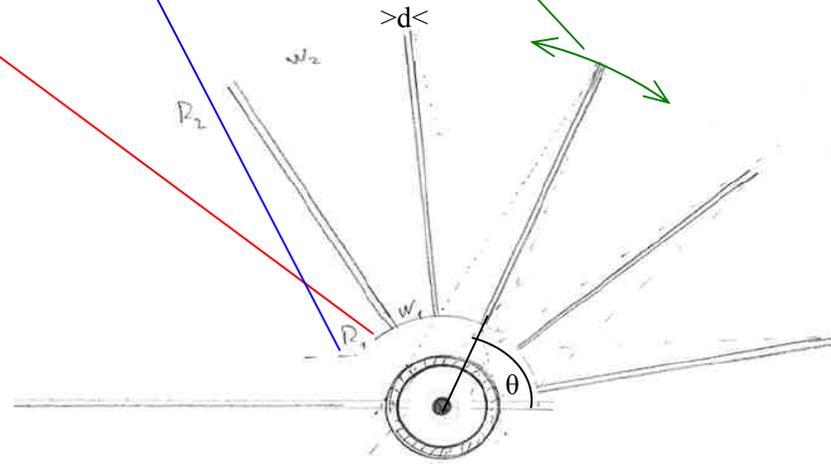
## Task 3.2: Radial Collimator

1. If you like: add a radial collimator around the aluminum cylinder and check the reduction of background

collimator\_radial module 5

theta [deg]	0	width [deg]	360	oscillation width [deg]	9
entrance height [cm]	20	exit height [cm]	20		
distance [cm]	17	length [cm]	17		
number of channels	127	blade width [cm]	0.015		

Done



## Task 3.2: Eval\_elast

parameter:  
scattering angle  
d-spacing  
Q

eval\_elast module 9

evaluation parameter: scattering angle [deg]

spectra file: detector2.sca [Browse] [BrowseN] [Edit] [Plot] [AutoPlot]

intensity file: [Browse] [BrowseN] [Edit]

info file: [Browse] [BrowseN] [Edit]

number of bins: 360 [minimum [A, 1/A, deg]: 0] [maximum [A, 1/A, deg]: 180]

increase to next bin [%]: [dead-spot [deg]: ]

probability weight: yes [time of flight: no] [exclusive counts: no]

flight path [cm]: [time offset [ms]: 0] [reference wavelength [A]: 2.0]

time interval begin [ms]: -1.e10 [time interval end [ms]: 1.e10] [colour: 2]

[Done]