SliceView

version 0.1

DANSE/SANS Group
University of Tennessee

SliceView is a modeling prototype application for SANS.

What's new in version 0.1:

- 1D data fitting has been added
- A new panel has been added to let the user define a Gaussian angular distribution for oriented models
- The layout has changed to let users arrange the various windows
- Circular averaging of loaded data has been added

Roadmap:

SliceView is a prototype application provided to the community to generate feedback. It is intentionally limited in scope and functionality, and is part of a broader effort to provide analysis tools to the SANS community.

In providing this application, we hope to learn about the analysis needs of our users.
We are interested in suggestions in two areas:

1. Functionality: what functionality would you like to see in an analysis application for SANS
2. Ease-of-use: how would you improve the user interface

Version 0.1 is expected to be the final major release of SliceView. The functionality provided by SliceView will be incorporated in a more complete analysis application scheduled for late 2008. SliceView will continue to be supported until the new application is released, and updates will mostly focus on bug fixing.

Contact us:

You can visit the SliceView web page at: **http://danse.chem.utk.edu/sliceview.html**

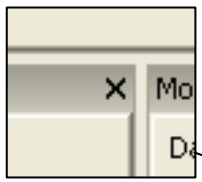
For comments, feature requests and bug reports, you can write to us at **sansdanse@gmail.com**

The interface

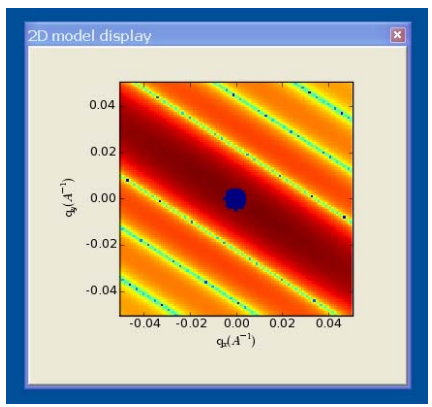
DANSE/SANS Group
University of Tennessee

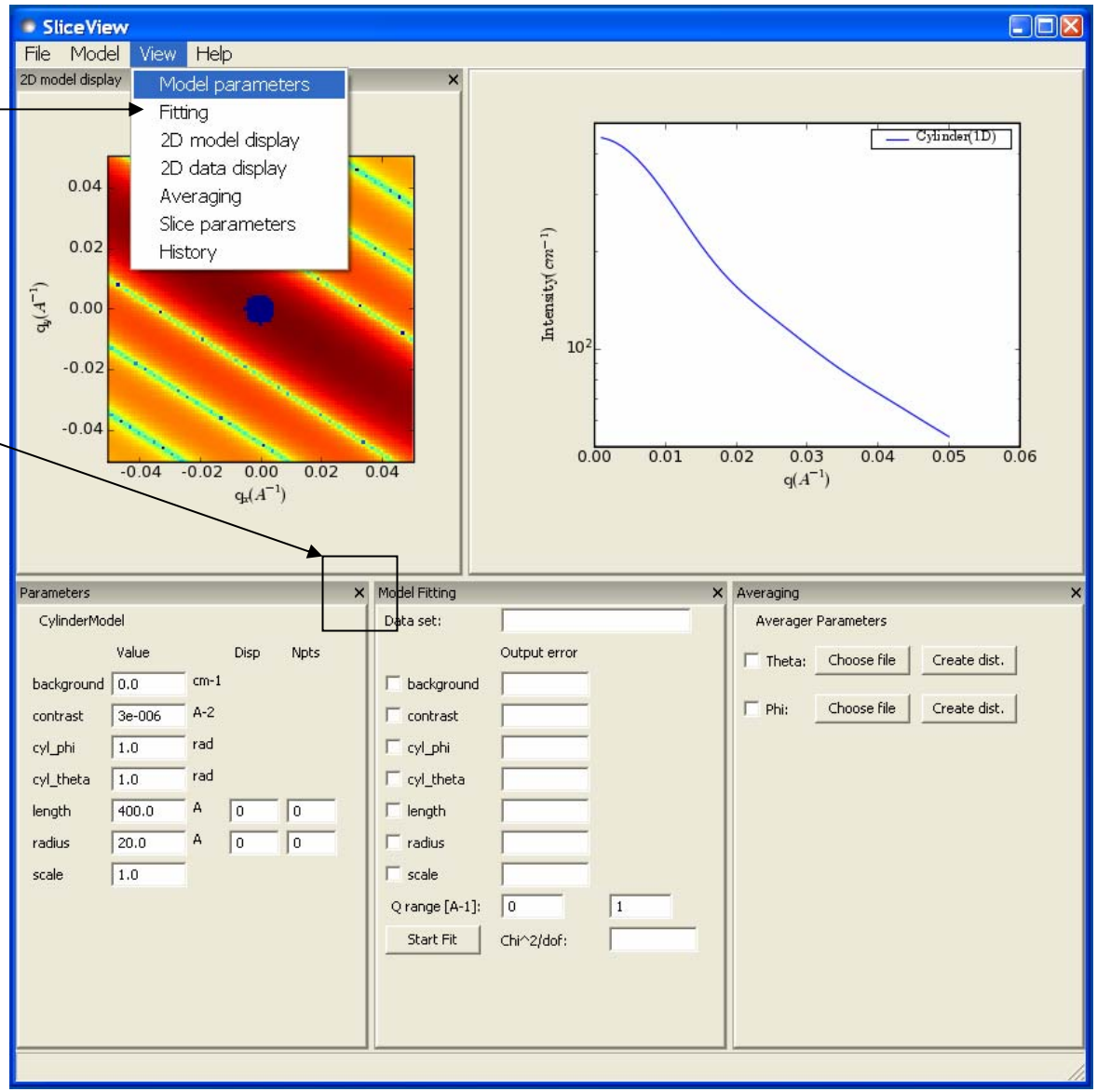
A selection of panels is available in the View menu. Choose one and it will be opened in the interface.

Each panel except the 1D plot can be closed by clicking the "X" mark on the upper right corner.



You can rearrange your workspace by clicking on the title bar of a panel and dragging it outside the interface





Selecting a model

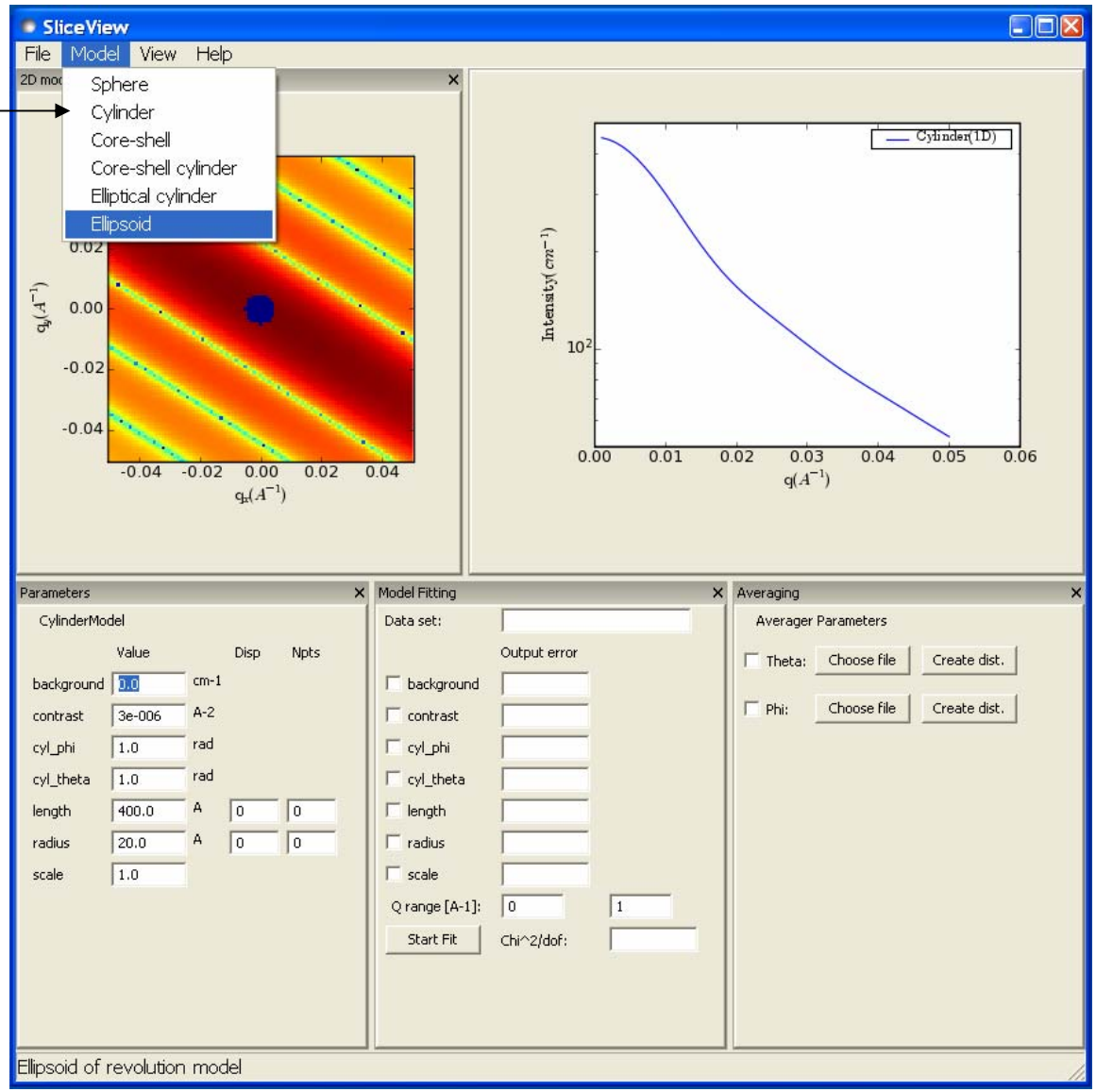
DANSE/SANS Group
University of Tennessee

Choose your model

Once a model is chosen, I(q) is displayed in the 1D panel and $I(q_x,q_y)$ is displayed in the 2D panel

Change model parameters

Once a parameter is changed, the plots will update automatically



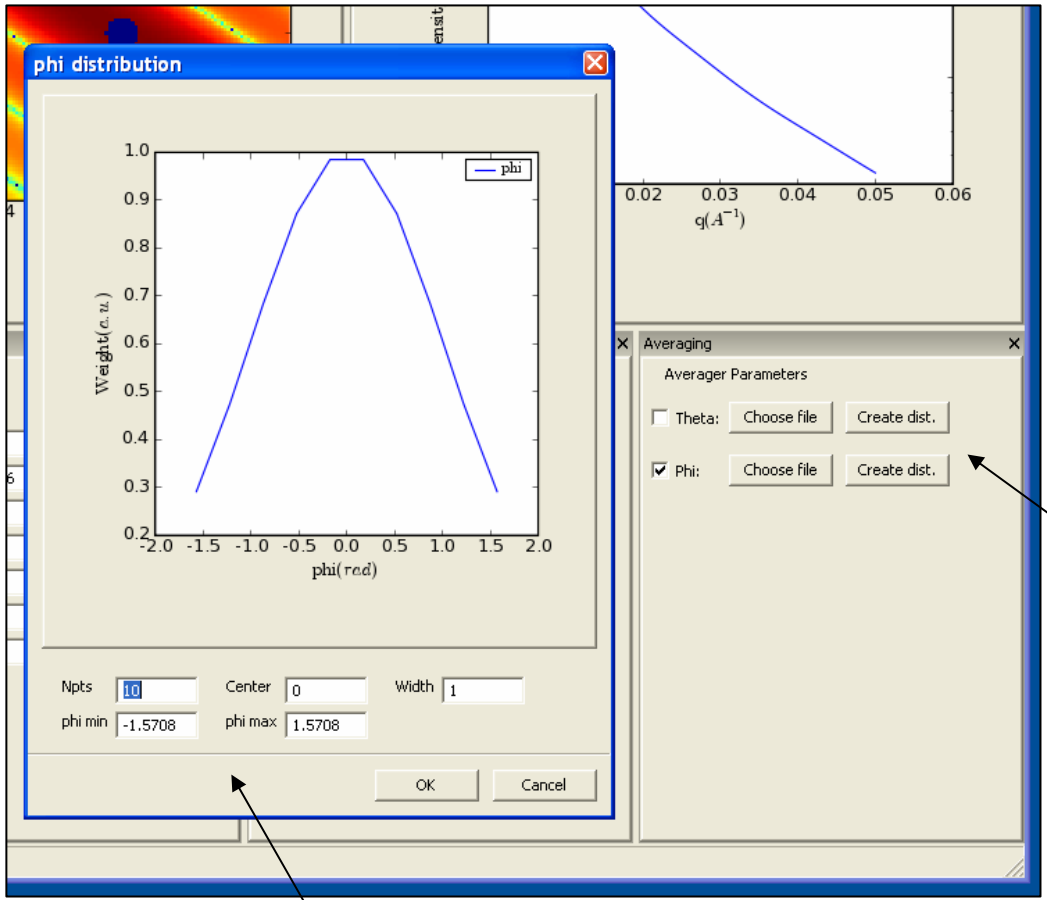
Definition: **Dispersion**

The dispersion ("Disp") is defined as a the standard deviation of a Gaussian distribution around a parameter value.

The averaging is performed over 4 standard deviations around the center, and the sampling is given by the "Npts" parameter.

Selecting a model

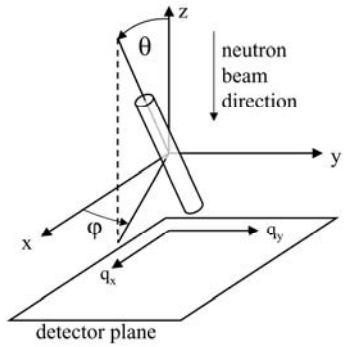
DANSE/SANS Group
University of Tennessee



We define the orientation of our models with two angles:

Theta & Phi are defined with respect to the beam and the projection in the plane of the detector.

Theta is defined between 0 and π, and Phi is defined between 0 and 2π.



There are two options to average over an angular distribution:

1- Click “Choose file” to select a file with angular distribution (two column ascii).

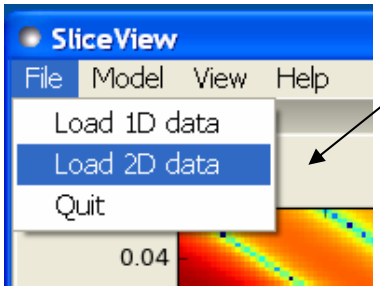
2- Click “Create dist.” to create a Gaussian angular distribution.

All input distribution are normalized to 1 during averaging.

To create a Gaussian angular distribution, select the range of your distribution (“min” and “max”), select the number of sampling points on the distribution, the center of the Gaussian and its width. Click OK to apply.

Loading 1D and 2D data

DANSE/SANS Group
University of Tennessee

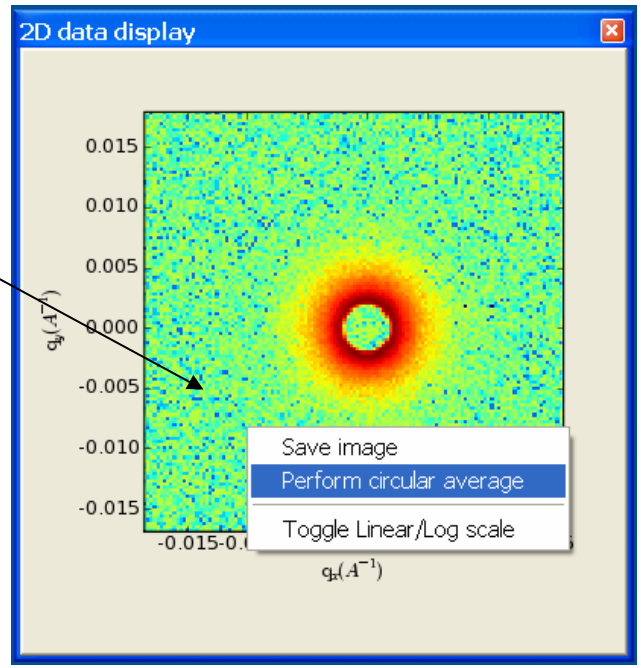


Data files can be loaded from the File menu.

1D data files are two-column ascii. The 1D data is plotted on the 1D graph.

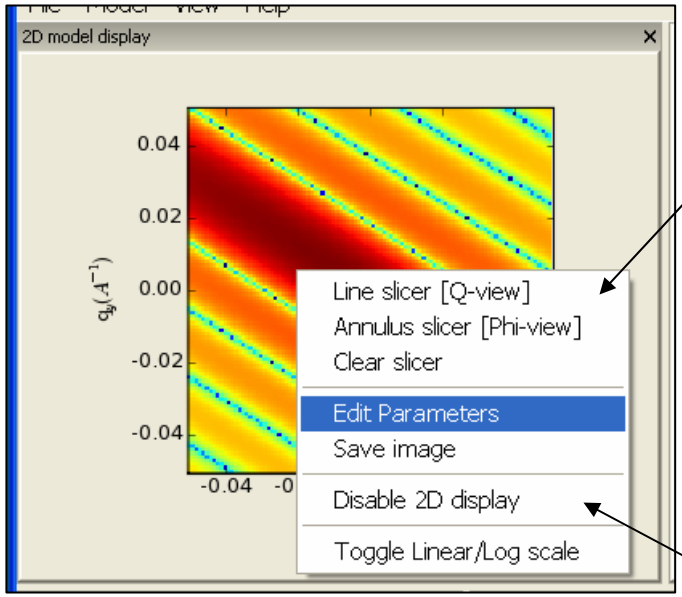
2D data files are NIST standard SANS files. The 2D data is plotted on the 2D graph.

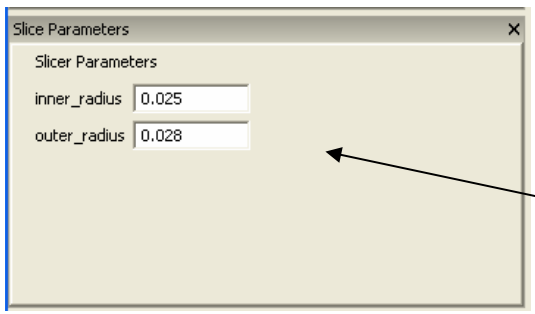
By right-clicking on the 2D data display, you can perform a circular average of the data that will be shown on the 1D graph and can be fitted.



2D panel menu

DANSE/SANS Group
University of Tennessee





Right-click on the 2D model display to make the context menu appear.

SliceView offers the choice of two types of slices on the 2D plot:

- A line slice, for which the values along a radius are plotted as a function of Q.
- An annulus slice, for which pixels are averaged as a function of the angle φ in the plane of the detector (around the beam axis).

You can choose “Disable 2D display” to turn the 2D calculations off to speed up 1D analysis.

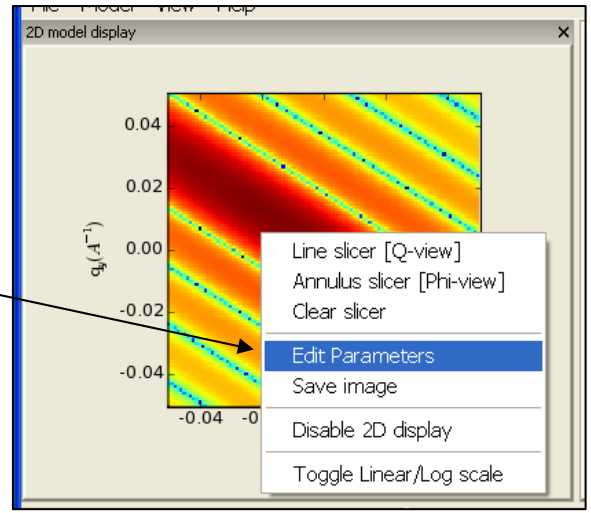
Click on “Toggle Linear/Log scale” to change the scale of the plot.

The “Slice Parameters” window from the View menu allows you to enter slice parameters by hand.

Editing the 2D plot parameters

DANSE/SANS Group
University of Tennessee

By choosing “Edit Parameters”, you can change parameters of the detector and the 2D plot.

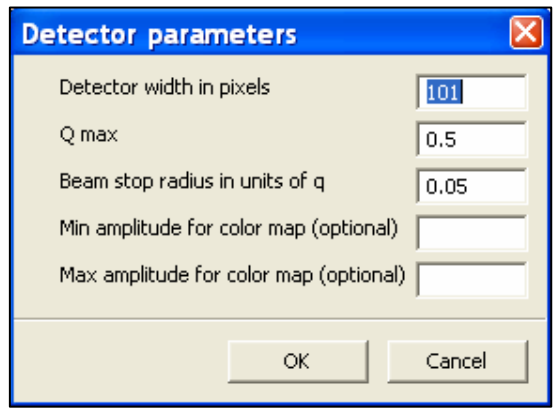


Choose the detector width in pixels

Choose the maximum Q in $Å^{-1}$

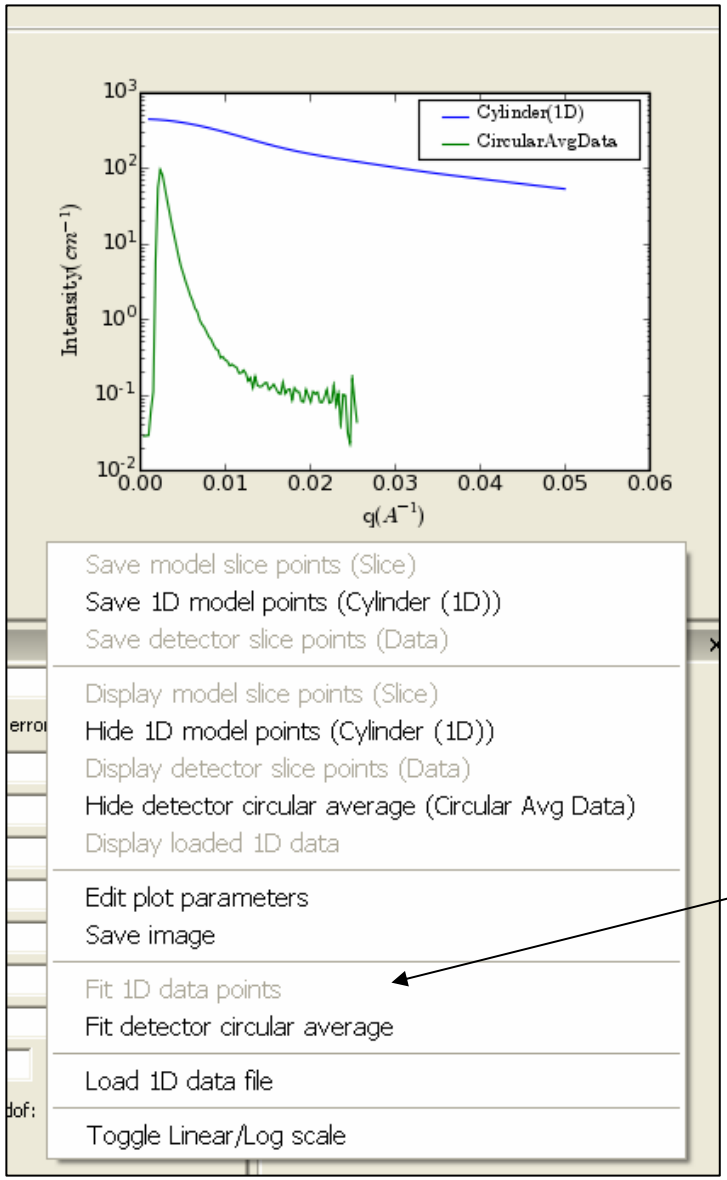
Choose the radius of the beam stop in $Å^{-1}$.
The beam stop will be subtracted from the distribution.

Select the amplitude range that will map between 0 and 1 for the purpose of choosing a color map for 2D plotting. If the fields are left empty, the color map of each plot will scale independently according to each plot’s minimum and maximum values. Entered values will be applied to both model and data plots.



1D panel menu

DANSE/SANS Group
University of Tennessee



Right-click on the 1D model display to make the context menu appear.

The menu allows you to:

- Save displayed data in a file
- Display or hide data on the plot
- Save the plot as an image
- Toggle the scale from linear to log

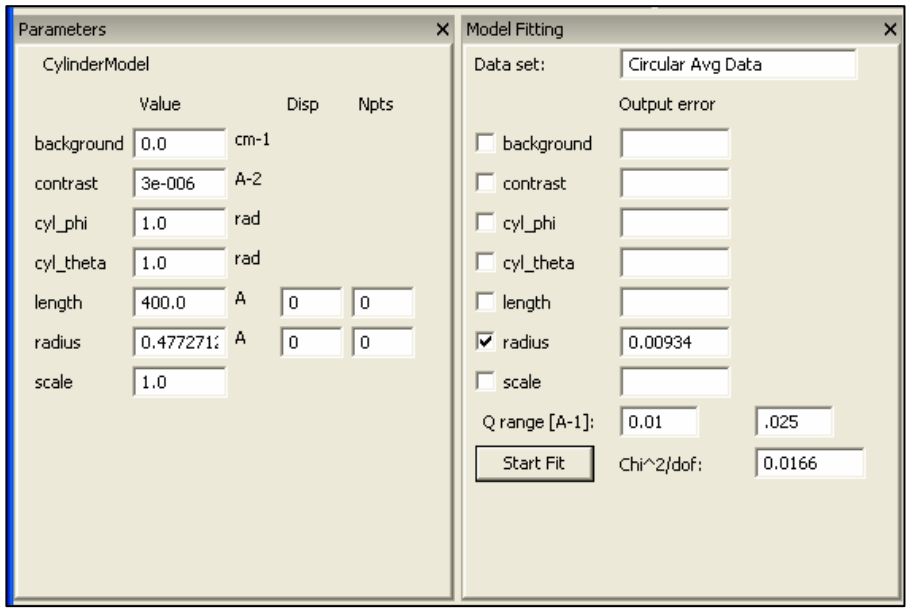
Clicking “Edit plot parameters” allows you to select the number of sampling points for the displayed model and select the Q range.

You can also load two-column ascii data by clicking on “Load 1D data file”.

Loaded 1D data and circular average data computed from loaded 2D data can be selected for fitting by clicking the appropriate menu item (see “Fitting”)

1D Fitting

DANSE/SANS Group
University of Tennessee



The Model Fitting panel allows you to fit 1D data. Once a data set is selected from the 1D context menu, the name of the data set appears on top of the fitting panel.

You can then check the boxes corresponding to the parameters you want to fit.

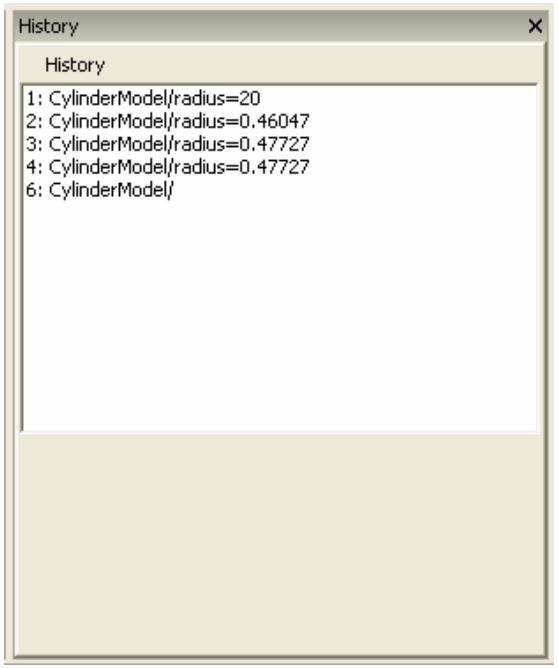
You can enter the Q range in which fit will be performed.

After clicking Start Fit, the errors on the fitted parameters will appear in the corresponding boxes and the χ^2 over degrees of freedom will be shown.

The model parameters and the plots are updated automatically after each fit.

The history panel

DANSE/SANS Group
University of Tennessee



A history of the calculated models is kept throughout the session. You can revert back to a model computed earlier by clicking on the item on the History panel.

Right clicking an item allows you to rename or remove that item.

Items are kept until they take up too much memory for your system. Once that point is reached, the oldest item will be removed every time a new item is added.