Instructions for Loading McStas Simulation

- Use the latest version of VirtualBox to launch the Ubuntu 16.04 virtual machine provided.
- The username and password are both `vagrant`.
- Launch a terminal window (CTRL/CMD+ALT+T)
- Launch McStas GUI Controls `mcgui &`
- In the MCGUI go to `File->Open instrument` and select
  `/home/vagrant/Desktop/LOKI/loki_master-model.instr`
- To view the contents of the instrument file select `Edit/New`.
- To run the simulation "as-is", just hit `Run` which launched the run dialog.
- Click `Start` and the simulation will commence.
- When the simulation is complete hit `Plot` to see the results.
- In order to close the graph window, users must press `Q` on the keyboard.

Tracing

- Click `Run`in the mcgui and change the `Simulation`option to `Trace` and then click `Start`.
- A 2D instrument view (X-Z) will be displayed.
- To zoom into the instrument hit Z on the keyboard and use the mouse to select a region of interest.
- Right-clicking resets to the previous zoom.
- Hit the space bar to trace individual neutron packets.

N.B The version of the loki-master-model.instr being used was developed by Andrew Jackson of the ESS. There have been a few minor modifications for outputting additional TOF and wavelength information. The ESS have a bitbucket repository with regular revisions to the loki instrument. These files represent a snapshot in this development with a few minor changes.

Modifying the instrument file

Components

A list of all components and their descriptions can be found here. You can also download and view the source-code for each component.

Source

The source currently being used in the loki instrument file is the ESS butterfly moderator (Line 283). To switch between this moderator and the basic ESS moderator, comment `//` Lines 283-287 and remove the comments from Lines 289-296. The paramaters for these moderators can be found here:

- ESS_butterfly
- ESS_moderator

Sample

The sample (Line 670 of the instrument file), is an isotropic water sample. The full details of this type of component can be found underlined here.

Monitors

Lines 732-750 of the instrument file contains three simple 2x2m detectors which measure intensity, time-of-flight and wavelength respectively. The positions of these detectors are set to be ~1m along the beamline with respect to the sample using the mcstas `AT (x, y, z) RELATIVE SAMPLE` formalism, where z is along the beam direction. Once can easily modify this position by changing the `z` value. The TOF detector is currently set to detect time of flight values between 0 - 0.1seconds (tmin and tmax). The Lambda detector is set to detect wavelengths between l_min_source and l_max_source which are calculated based on the instrument parameters lmin=3.0AA and lmax=9.7AA.

MCSTAS Team

For further information contact the ESS Mcstas Team: - Torben Nielsen/Peter Willendrup DMSC Website - Andrew Jackson (original author of loki_master-model.instr) - General McStas queries