

June 21, 2006 SHUG Breakout Session at ACNS:

Greg Smith – HFIR Cold Source Update:

Greg Smith gave a presentation describing the progress on the HFIR cold source and an update of the HFIR User Program

The reactor is scheduled to run in December but this will most likely be a rather unstable cycle designed to test the new cold source. The first real cycle for the SANS instruments will likely be in late spring.

A question was asked about progress on the CG4 triple-axis spectrometer – namely, if money were available, could the installation schedule be accelerated. It was mentioned that DOE is refusing to provide extra funds until the cold source has proven that will operate successfully. If more money becomes available, it may be possible to get the CG4 TAS running on an accelerated schedule.

Greg presents the HFIR instrument installation schedule. A couple of instruments are going to be installed but, currently, there isn't sufficient financial support to put them in user program (most notably, the powder and single crystal diffractometers).

Q. When will start running user experiments on thermal beams? This will likely not happen in the December cycle as it will be an unstable cycle – most likely, the time schedule for thermal experiments will also be in the spring.

The question was raised as to the future of the CG1 cold triple-axis spectrometer. Currently, the hope for CG1 is that HFIR will put together an instrument project (similar to the SNS SING project) and CG1 together with a couple of other instruments will make up this project.

Rob Briber – SANS from a User's Perspective:

The new instrument capabilities provided by the HFIR SANS instruments will allow for new types of experiments to be performed - kinetics, small sample size (especially for biology experiments), novel in-situ experiments

Things that will hopefully be achieved on the HFIR SANS instruments:

- high flux on sample - particularly high brightness
- low Q
- multiple Q ranges
- low background
- absolute intensity
- time slicing detector gating
- polarization analysis for the purposes of reducing incoherent background

Essential sample environment and support facilities:

- flexible sample position - large to allow for new capabilities
- multiple sample holder
- temperature range control (-10 to 90C)
- higher temperature stage (mostly for polymers) (25-300C)
- sample cells for all stages

Second tier capabilities (not required immediately but should be eventually provided):

- shear cells
- pressure cells
- T Jump cell/stage
- titration cells / stop flow cell
- high T furnace (500C or higher)
- magnets/cryostats - generally not for soft matter (i.e flux lattice measurements)

***** It is absolutely essential to have adequate sample environment expertise / support not only to help run the equipment but also to help implement new ideas***

Critical support facilities:

- wet chem lab - at least 500sq. ft. - will be used for multiple instruments and should accommodate several user groups
- soft material lab space
- biological systems lab space - refrigeration space to store samples

***** Another absolutely essential thing is to have the correct staffing level to support instruments.***

There is a 2-3 day turn around on typical soft matter (non-biology) experiment. With such a rapid turn around, you can burn-out instrument scientists quickly. A minimum of 4-5 staff interacting with users on instrument is necessary (this can be a combination of scientists and technicians)

The laboratory support space at HFIR isn't outfitted yet as additional funds are required. A plan is in place but can't be executed until the funding is in place. There are 2 labs - a biology and wet chemistry lab.

It's essential that users need to be able to make new samples on site to respond to what's seen in experiment.

****** need to build a culture of running a user facility *******

Software:

- GUI based to allow for rapid learning.
- idiot proof design - fail safe controls (particularly to protect the SANS detector)
- calculation tools should be available on the web for experiment planning
- include basic tutorial on instrumental function
- documentation - software manuals

Additional software related requests:

- remote collaboration beside the instrument (video teleconferencing)
- remote operation is generally not needed (or wise)

Eventually, help is also needed for data analysis / paper writing – this is the next step above running the instrument. Less experienced users will need help with data analysis – such help can be provided individually and also through workshops, tutorials, etc.

Q. What about dynamics with SANS - Rob - it would probably be interesting but he hasn't thought much about it. On many soft matter systems time scale is typically on order of milliseconds which is typically incompatible with neutron scattering time scales.

Thom Mason – SNS Update:

Thom Mason gave a presentation describing how things will evolve for SNS

Currently there are 3 instruments installed - backscattering, and two reflectometers.

The backscattering instrument needs work to produce publishable data - mainly associated with background reduction.

The plan is to run at 10kW for the next month and maybe jump to 20kW in September.

By autumn, it may be possible to start doing some experiments.

The two reflectometers will see first beam in July and will then start same process of debugging instrument as for backscattering instrument.

Initial users starting this fall – these will be informal experiments without the formal rigor of the eventual user program. An announcement will be sent out. Proposals will be accepted as they come without a specific deadline. There must be a scientific case but experiment feasibility (during low power ramping) will be a serious concern. Initial users will need to be flexible in terms of scheduling and shouldn't be novice users.

Email announcement of the start of this initial user process will come from Al Ekkebus sometime in the fall for 1st 3 instruments.

Longer term – the plan is to achieve 100 kW operation by next spring. Currently, they only have permission to ramp to 100 kW, an operational readiness review is scheduled for this spring to allow for operation beyond 100kW. As a reminder, ISIS is 160kW - with instrument improvements, fall cycle should allow for real experiments to be performed. In addition to the lower source power, the fall cycle will probably run at 20 or 30 Hz and not the full 60 Hz. This will most likely help in reflectometers and possibly even backscattering.

Fall 2007 - begin general user program for these first 3 instruments. Winter 2008 – 1 MW capability with 7 instruments in general user program.

Q. Will there be a housing facility for users? No housing will be available during the initial user phase. Design has begun on a housing facility but won't be completed until 2008 which is when full user program really gets rolling.