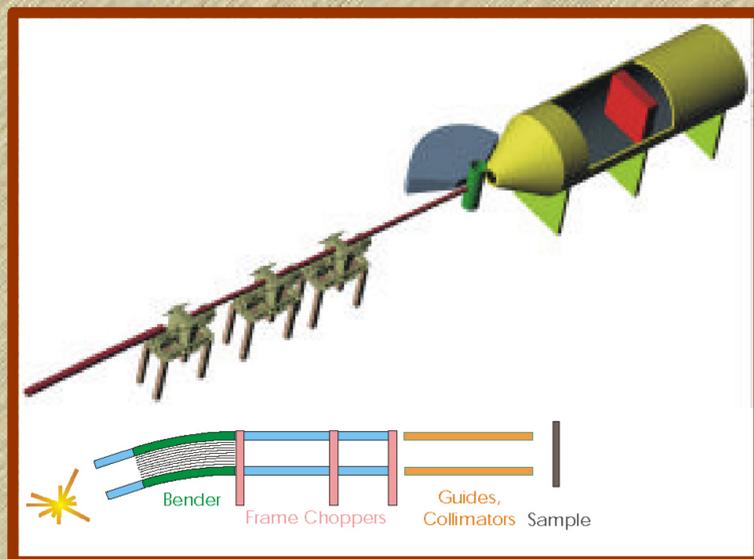
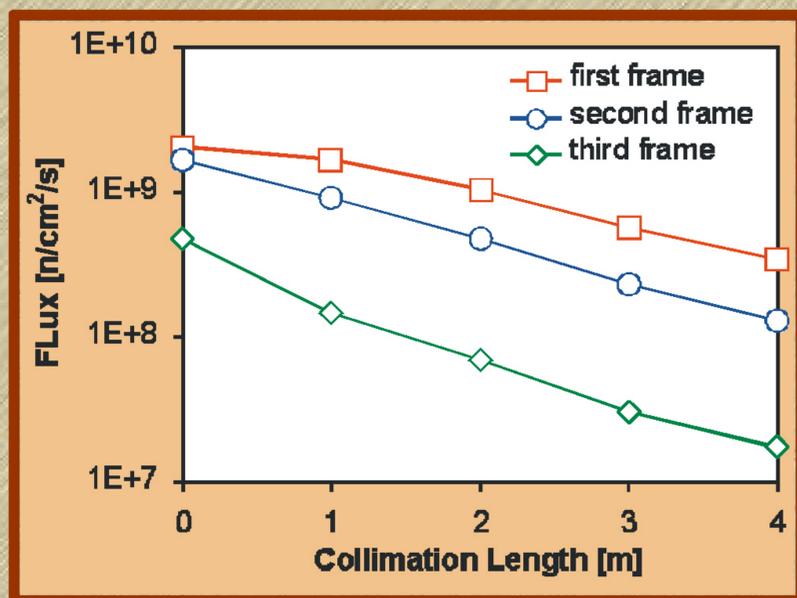


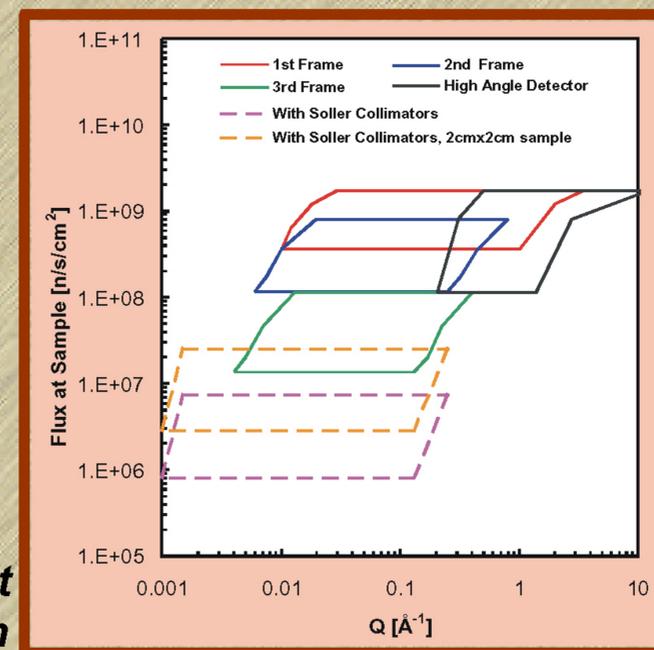
# The Extended Q-Range Small Angle Diffractometer



This instrument is a large Q-range, high precision, high intensity SANS. The 18m-long machine is optimized to the coupled, cold moderator on the 60Hz HPTS. It uses a multi-channel, super-mirror beam bender to bend the beam by  $\sim 2.6^\circ$  to avoid the direct line-of-sight from the moderator. Three bandwidth choppers are used to completely eliminate frame overlaps. The instrument will be equipped with a movable, large area detector and a high-angle detector bank. Variable collimation schemes, including Soller collimators, will be provided.

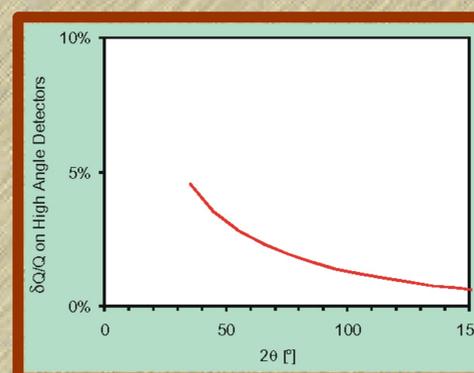


The neutron optical system for the extended-Q SANS is optimized for maximum neutron transport, allowing the instrument to have higher usable flux at sample position than the best machines currently in operation.



The minimum accessible Q-value on this instrument,  $Q_{min}$ , is designed at  $0.004 \text{ \AA}^{-1}$ . With the use of Soller collimators,  $Q_{min} = 0.001 \text{ \AA}^{-1}$  can be achieved. The accessible  $Q_{max}$  value will be  $3 \text{ \AA}^{-1}$  on the main detector and  $12 \text{ \AA}^{-1}$  on the high-angle detectors.

One of the unique features of this machine is its very large dynamic Q-range. A  $Q_{max}/Q_{min}$  ratio of  $>100$  can be obtained on the main detector. With high-angle detectors and when Soller collimators are used, a  $Q_{max}/Q_{min}$  value in excess of 4000 can be achieved.



In addition to the large dynamic range and high intensity, this instrument will have very high precision, or wavelength resolution. The  $\delta\lambda/\lambda$  values will be  $<0.5\%$  for all experimental setups, enabling high Q-resolution on the high-angle detectors.