



Bending Magnet Beamline

Project Status

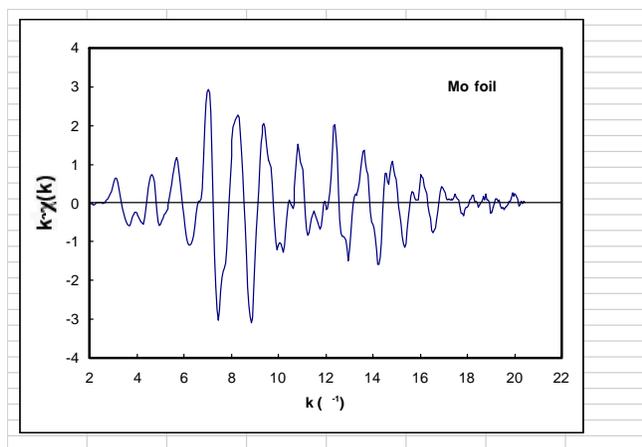
The three year construction project funded by EMSP has been completed. However, additional funding has been secured from DOE-BES, which has allowed the original project to be expanded. The expanded project includes:

- a full size experimental hutch
- a collimating/focusing white beam mirror
- additional experimental capabilities

Approximately 2 years remain in the BES funding. This poster describes the final beamline configuration, and current status.

First result from beamline (3/31/99)

Below is an example spectra obtained from a Mo foil during the first two days of commissioning. The excellent signal-to noise demonstrates the capability of our well tested monochromator design.



Scanning Monochromator

The **monochromator** is the most important component in a spectroscopy beamline. The BM line uses a modified version of the BESSRC-CAT design. This has been well tested for spectroscopy applications on our neighboring undulator beamline.



Some important design parameters of the bending magnet monochromator:

- Water cooled first crystal
- Fixed output beam
- Energy range: 2.3-30keV (Si 111); 5-50keV (Si 311)
- Sagittal focusing of up to 3 mrad of beam
- Flux of $\sim 2 \times 10^{11}$ ph/sec in unfocused mode, and up to $\sim 5 \times 10^{12}$ ph/sec with vertical and sagittal focusing. Flux densities will be $\sim 4 \times 10^9$ to 3×10^{12} ph/sec/mm².

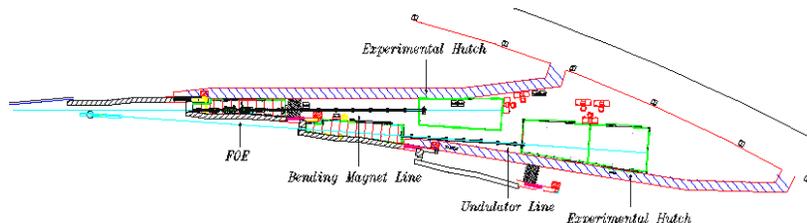
Experimental capabilities

- XAFS: fluorescence detection, UHV/surface, low temp.
- Diffraction and DAFS: kappa diffractometer
- MBE growth chamber
- Microbeams: K-B mirrors and tapered capillaries
- Micro-tomography

Bending Magnet Beamline Layout

Plans for the bending magnet line include a collimating/focusing premirror and sagittal focusing with a bent second crystal. The premirror will allow us to accept nearly the full vertical extent of radiation while maintaining good energy resolution. For experiments not requiring the best energy resolution, the mirror can be used for focusing the beam vertically to submillimeter dimensions at the sample position. The focusing second crystal will allow us to accept about 3 mrad of the horizontal fan of x-rays. After commissioning the front end window will be replaced with a differential pump for windowless operation. This will allow operation at low energies. The K-edge for elements as light as S can be studied.

PNC-CAT Beamlines



FOE Components for Bending Magnet Line

