UVX/LNLS

1.37 GeV4 straight sections:

- 1 regular Wiggler for PX – MX2 beamline
- 1 undulator for soft x-rays - PGM beamline
- Superconducting Wiggler – XDS beamline



Superconducting Wiggler



Manufactured by Budker Institute, Russia

Beamline requirements

- Only one shot for XAS and XRD, so the beamline must be versatile !
- Must be easy to operate, minimum dead time to exchange setups.
- The beamline must access a relatively broad energy range (~5-30 keV)

• Horizontal focusing:

- EXAFS community demands DCM with plane crystals, toroidal focusing mirror, for greater stability and reproducibility.
- Diffraction and scattering community demands DCM with sagittal crystals for horizontal focusing, and cylindrical focusing mirror, for control of the horizontal divergence (GID, reflectivity).

Optical Layout



- Vertically collimating mirror (VCM):
 - Water cooled
 - Three stripes, Si (5-10 keV), Rh (9-20 keV), Pt (14-30 keV).
- Double Crystal Monochromator (DCM):
 - First crystals: LN2-refrigerated Si(111) [5-20 keV) and Si(311) [14-30 keV]
 - Second crystals: Plane Si(111), plane Si(311), sagittal Si(111)
- Focusing Mirror (VFM)
 - Three stripes: Rh toroidal, Pt toroidal, Rh cylindrical (for use with sagittal DCM)



Optical Hutch





Beam shape at focal point (sagittal monochromator) E = 11 keVObserved Simulated (ray-tracing)



Beam shape at focal point (plane DCM, thoroidal M2) E = 17 keVObserved

Mode 3 M1(Rh)-DCM(Si111/plane)-M2(Rh/toroidal)



Energy resolution

