Simple Beam Characterization Tools:
energy resolution, flux, and divergence

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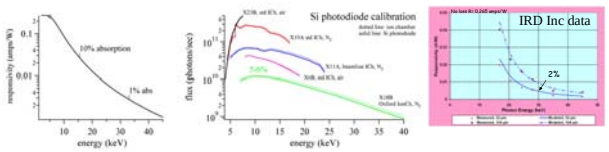
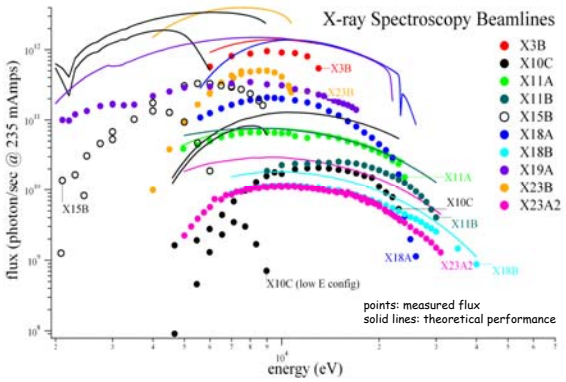
Photon Flux

Si AXUV photodiode response to hard x-rays

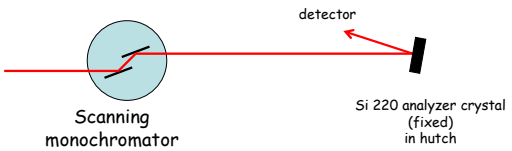


- flux can be easily and accurately measured with Si photodiodes of known thickness from 2-40 keV (AXUV-100G, IRD Inc.)
- inexpensive, low dark current, compact, very robust, no bias V needed

Uses: excellent first indication of beamline performance
Example: Survey of NSLS Xray Spectroscopy Beamlines

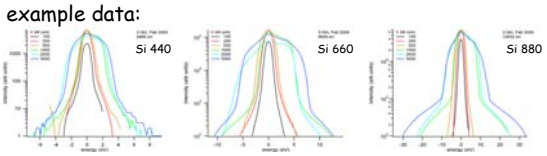


Energy Resolution

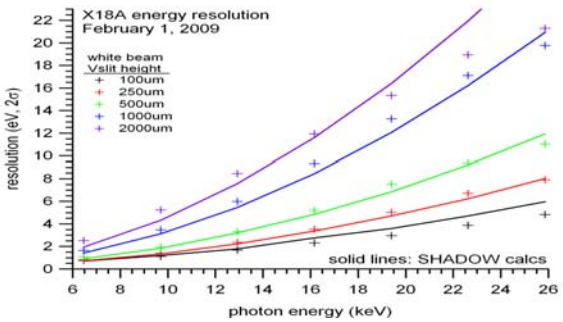


- applicable to any beamline with a scanning monochromator
- GREAT for spectroscopy beamlines!

example data:



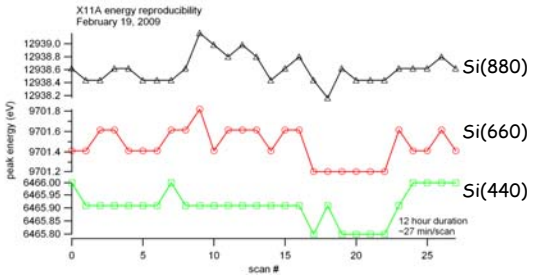
Beamline X18A Results:



Energy Precision/Reproducibility

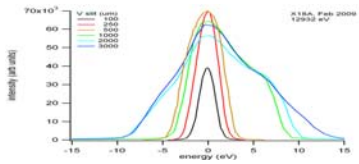
- the same apparatus used to measure the energy resolution can be used to test mono performance over a wide energy range

The following plot shows the results of repeated scanning of the X11A monochromator from 6466 to 12932 eV (17 deg range) for 12 hours



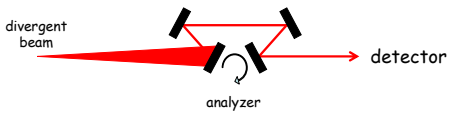
Monochromator crystal strain

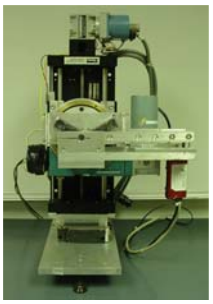
- the same apparatus used to measure the energy resolution can be used to test the quality of the monochromator xstals



Beam Divergence

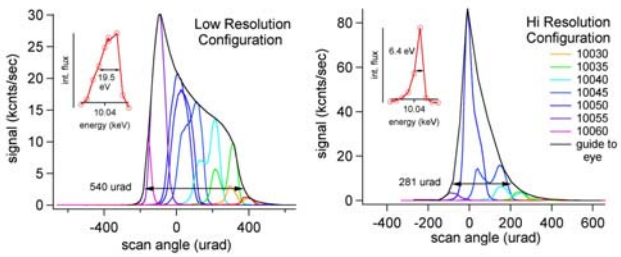
- A four bounce dispersing crystal set can be used to measure the beam divergence at several fixed energies
- easy to obtain sub urad resolution





X20A Results:

V divergence for two different beamline configurations



if any of this interests you, please contact J. Dvorak
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