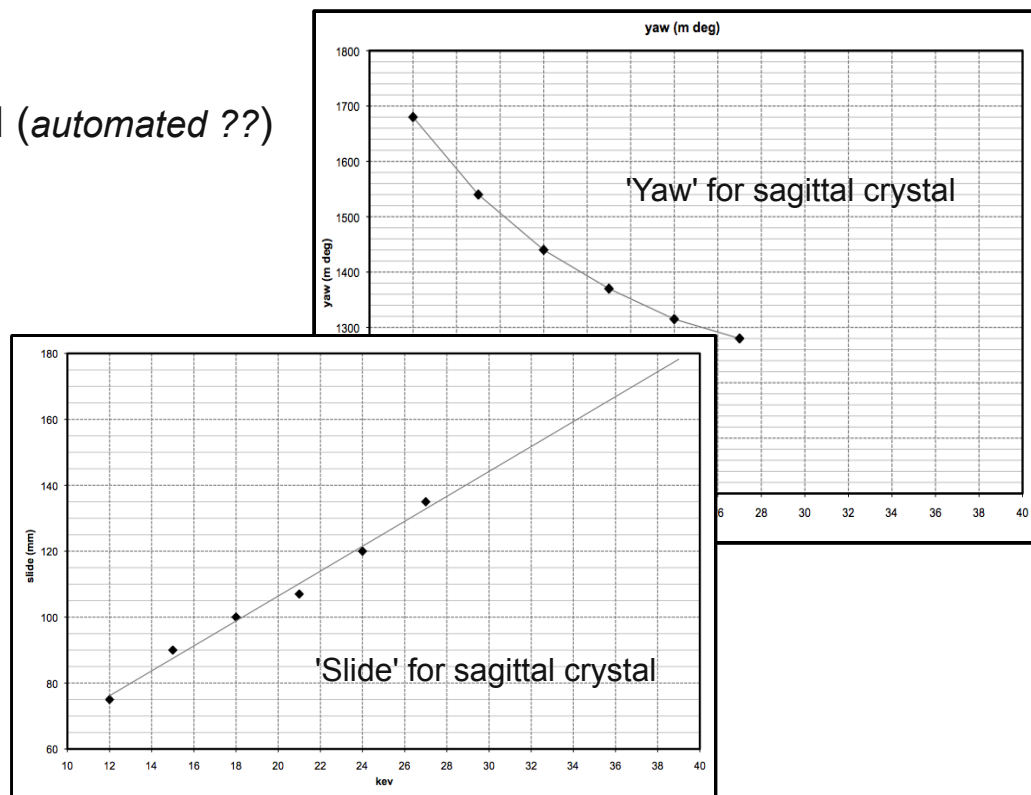
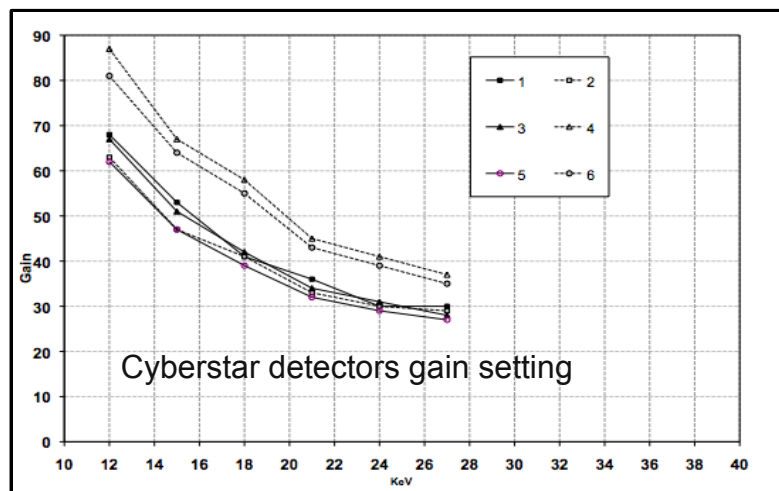


# 11-BM Energy/Wavelength Change Study: Overview

- Systematic mapping study of optics (A-hutch) & diffractometer (B-hutch) settings required to optimize 11-BM performance at different wavelengths.
- Investigating 3 keV steps over range 12 – 39 keV (i.e. 12, 15, 18... 39 keV).
- Change to new energy now takes ~ 2 days to complete. Using tabulated settings obtained in this study, expect to reduce required time to ~ 0.5 day.
- At present, one-half of targeted wavelengths achieved - will finish study by end of current cycle (2009-1).
- Several time-saving software automations of routine tasks (setting slit positions, Mono PZT optimization, etc) implemented during course of study.
- Preliminary data suggest that small (~ 2%) energy changes quickly achievable - permitting anomalous scattering studies (based on Sn, Sb K-edge @ ~ 30 keV)

# 11-BM Energy/Wavelength Change Study: Results

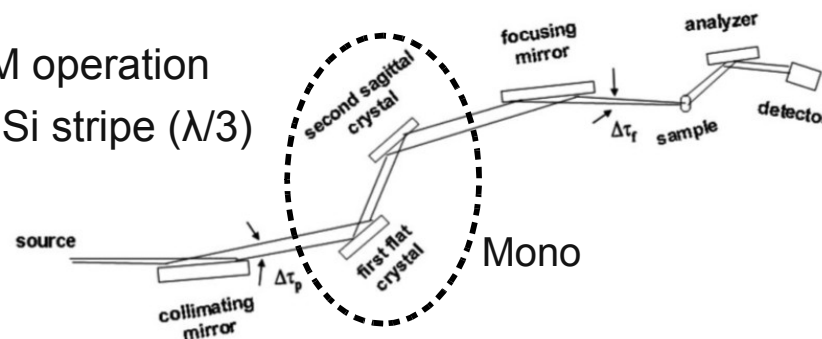
- Excellent beamline performance (evaluated by rocking curves, physical scans and LaB6 data) for energies examined at 15 keV and above. Lower energy (12 keV and below) requires new beamline diagnostics and further investigation (next cycle)
- Optimal settings for many (not all!) A-hutch optics & diffractometer parameters track smoothly over studied range.
- Extrapolated values should facilitate rapid (*automated ??*) changes for several variables in future.



# 11-BM Energy/Wavelength Change Study: Challenges

- Misalignment and twists in monochromator crystals limit performance
  - introduces complex interaction between 'roll', 'pitch', and 'bend' motions on 2<sup>nd</sup> crystal  
(reproducible “rough” bender positions; followed by iterative optimization)
  - can limit ability to achieve simultaneous physical & spectral beam focus
  - significant horiz. beam displacement at long wavelength (low keV)

- Restricted mirror motion further hampers 11-BM operation
  - effects corrective low energy steering, Pt vs. Si stripe ( $\lambda/3$ )



- Next steps...
  - *current cycle*: complete current study, establish efficient energy procedure (*this cycle*)
  - *shutdown*: implement improved diagnostics (mini hutch flags & mirror dial gauges)
  - *shutdown*: install camera / diode at detector position to aid focusing
  - *pending \$*: obtain replacement / spare sagittal crystal
  - *long term*: redesign 1<sup>st</sup> mirror mount