

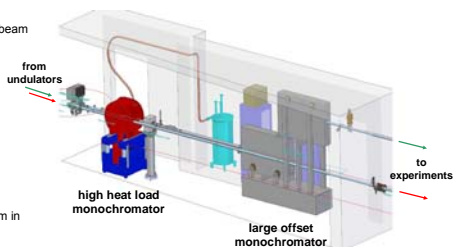
Large Offset Monochromator for the High Resolution Beamline P08.

M. Degenhardt, U. Hahn, J. Heuer, J. Horbach, H. B. Peters, H. Schulte-Schrepping and H. C. Wille, DESY FS-BT

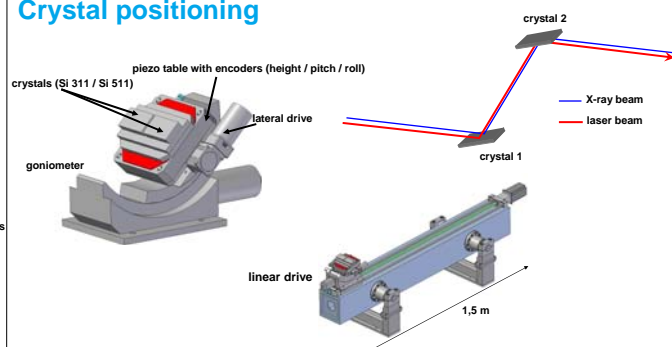


Requirements

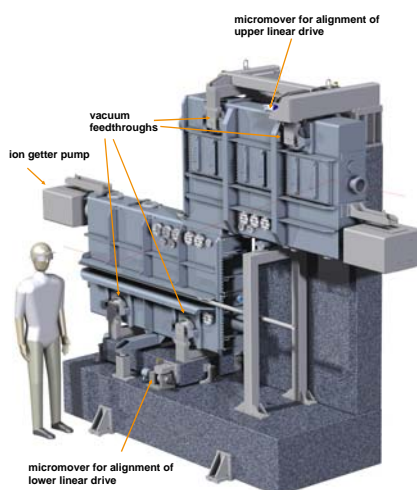
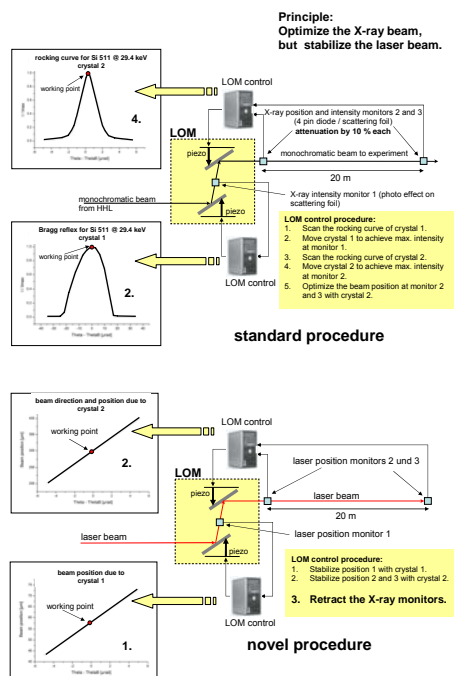
- Selection of a small energy band out of the high heat load monochromator beam
- Vertical shift of the beam by 1.25 m
- Stabilization of the beam position at the experiment
- Energy range
Si 311: 5.4 – 18.8 keV
Si 511: 8.4 – 29.4 keV
smallest step: 10 meV
- Precision of the beam position at the experiment (distance approx. 20 m): 10 μm in lateral and vertical direction
→ Angular accuracy of 0.5 μrad needed



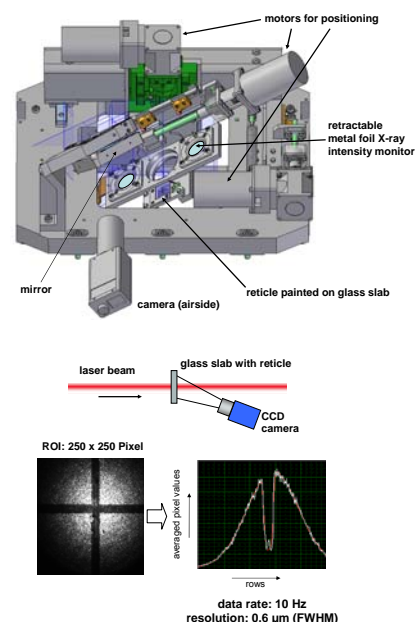
Crystal positioning



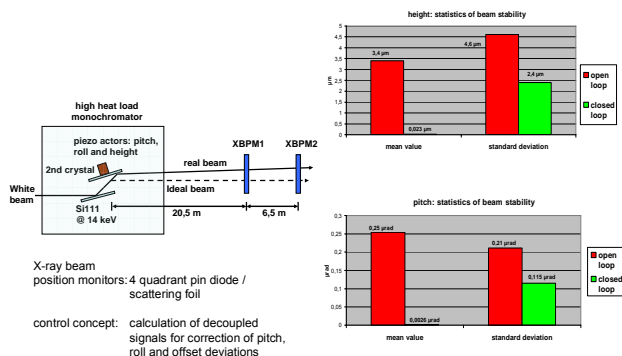
Beam stabilisation concept shown generically for pitch piezo



Sensor unit between vacuum vessels



Stabilisation test using the high heat load monochromator at ID6, ESRF



Conclusion and Outlook

- The stabilization control system showed its feasibility to correct the beam position and direction using 3 piezo actors.
- The stabilization can be used for the correction of long term deviations (i.e. thermal drift).
- Vacuum vessels are manufactured and fulfill the vacuum specification.
- The precision of the laser position monitors is sufficient to comply to the claimed resolution of 0.5 μrad .
- All components of the system fulfill the requirements and are ready for assembly.

References

- [1] Design of a Large Offset Monochromator at PETRA III
J. Horbach, M. Degenhardt, U. Hahn, H.B. Peters, H. Schulte-Schrepping
Nucl. Instrum. Methods A (2009, to be published)

