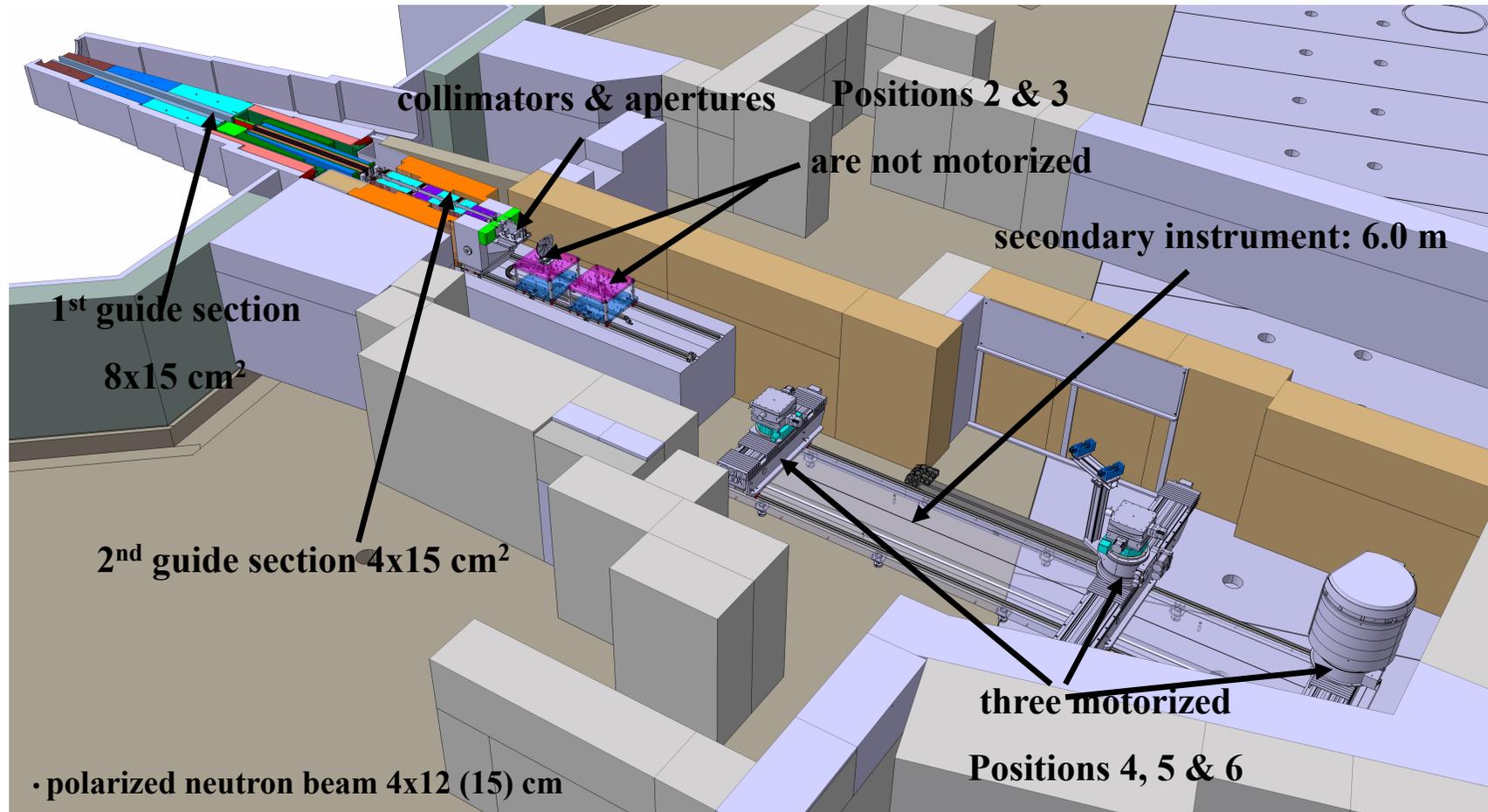


- (1) Successful operation from 25th May to 21st December 2012

- (2) 5 PSI groups + 3 external collaboration partners
 - ETH Zürich
 - DTU Denmark
 - TU Munich

- (3) Start-up of BOA was delayed (May 2012) – loss of 3-4 weeks beam time
 - without full electronic commissioning !!!
 - without software testing

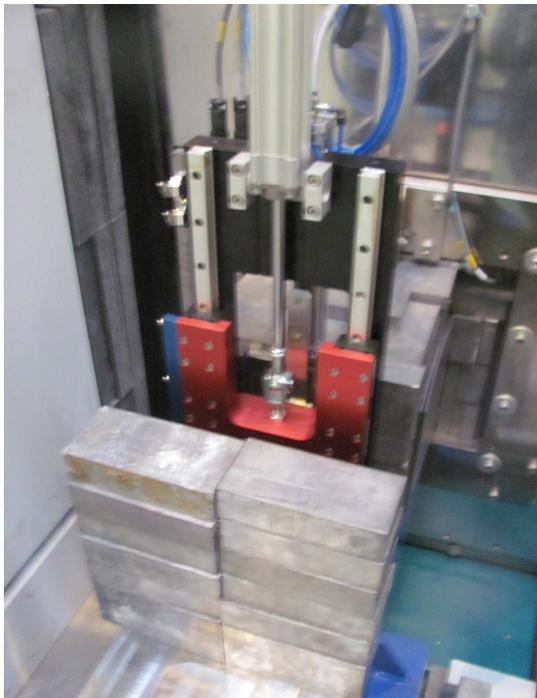
- (4) high flexibility of the beam line was used intensively !!!
 - preparing experiments need time and manpower
 - no “user” operation is possible



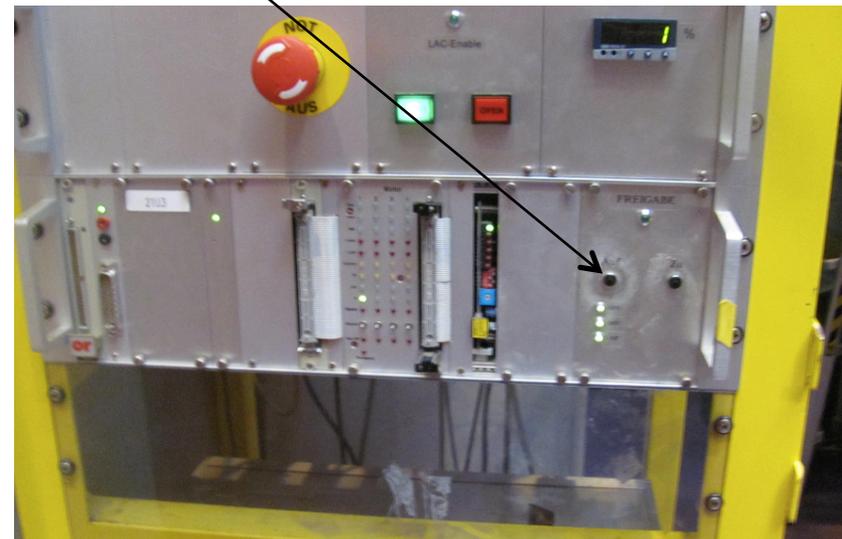
- polarized neutron beam 4x12 (15) cm
- 9.7 m (effective) free neutron flight path (straight) behind second guide section
- 5 measurement positions with a lot of flexibility (Hardware setups)
- different detectors
- add-on BOA equipment

Shutter System

- un-controlled alarms (every 40 - 70 openings)
- new motor control unit requested (in 2011)
- **“annoying” button** for opening the main shutter - change request to GFA / LOG



Experiment shutter



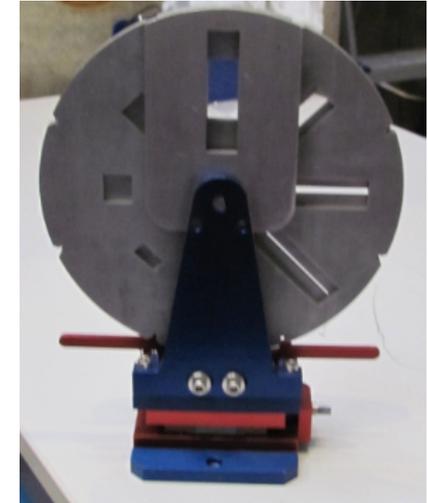
shutter control unit

Apertures – many options

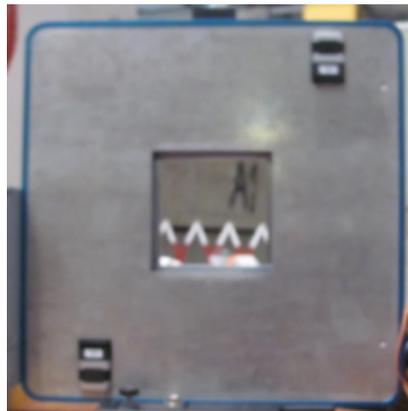
- 3 aperture weels
- 2 small motorized apertures +/- 40 mm in x & y
- 1 big motorized aperture 160 x 160 mm
- shutter aperture 120 x 25 (HxW)
- full setup of plug-in-apertures
- 1 high precision aperture +/- 25 mm in x & y (from the Selene Setup) **NEW**



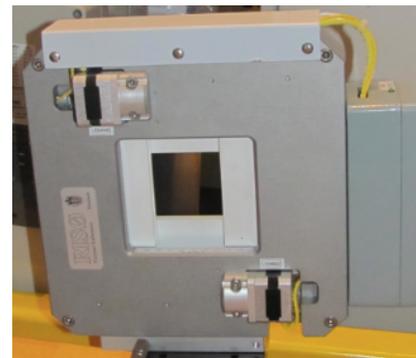
plug-in aperture



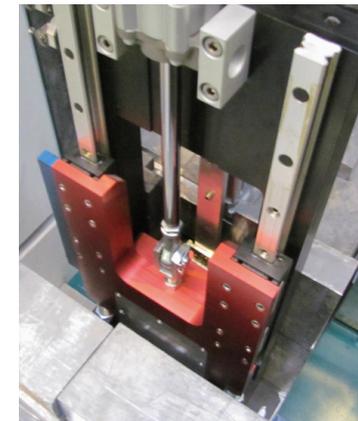
aperture wheel



Detector aperture

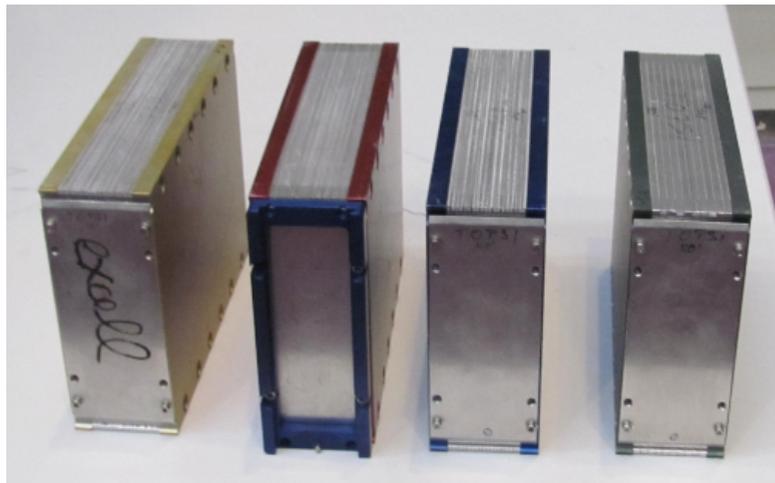


Small motorized aperture



Shutter aperture

- green laser system (beam center) at collimator position (can be also used backwards in the single detector)
- light source with 45 deg mirror at collimator position
- horizontal collimators 10, 20, 40 & 80 min (shared with Morpheus)
- vertical collimators 10 & 20 min (**NEW** - will be built in 2013)



horizontal collimators



Light source with heat control (**NEW**)

Detectors

- single He-3 Detector with shielding (no TOF option)
- Midi-box (CCD camera system – Andor) with 3 different Li-Szintillators (50, 100 & 200 μm thickness) + 2 objectives (50 & 100 mm) – **additional CCD camera planned (Cryo-lens project)**
- PSD detector (160 mm x 160 mm) shared with Morpheus (TOF option) + special table with manual z-translation



Single detector



Midibox – CCD camera



modified Morpheus PSD detector

Chopper systems

- mobil SINQ chopper system; non-magnetic – can be used for polarization; can be mounted on table 2 or 3; 20 Hz & two different disks are available (J.Kohlbrecher)
- Jülich chopper system (magnetic housing / size !!!)
- Selene chopper setup – small chopper pair (ESS pulse can be adjusted) **NEW** at BOA as standard hardware



mobil chopper system



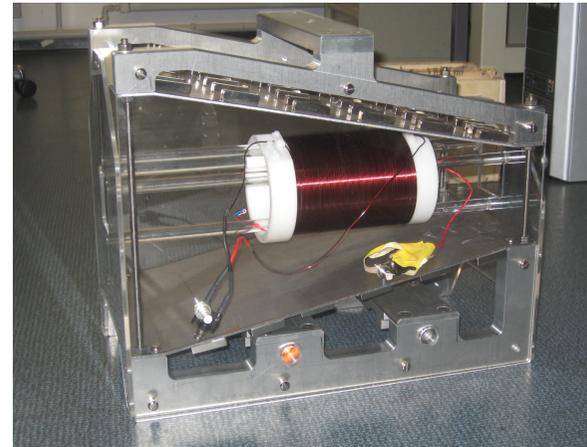
Selene chopper system

Spin-Flipper

- SANS spin flipper – designed for longer wavelength ($> 5 \text{ \AA}$) – can be requested by J. Kohlbrecher (priority problem!!!)
- **NEW** BOA spin flipper – design: P.Hautle; engineering: L.Holitzner ; flipper can be mounted on X95 profiles and psotioned at any place along the beamline
- Status: Tuning and testing of the device



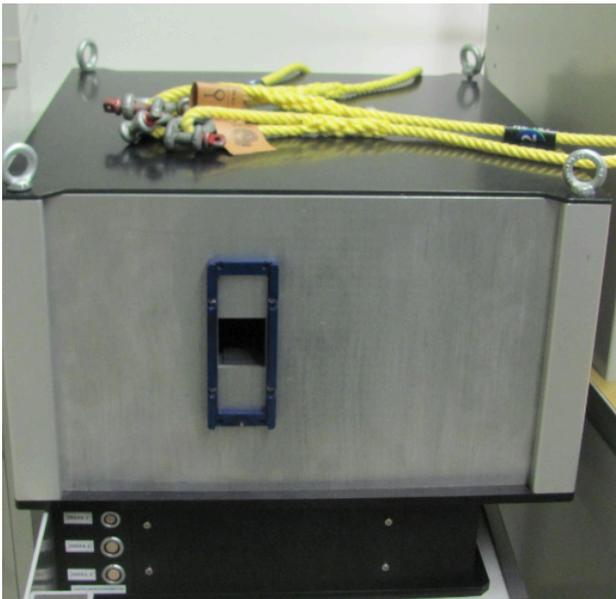
SANS adiabatic spin flipper



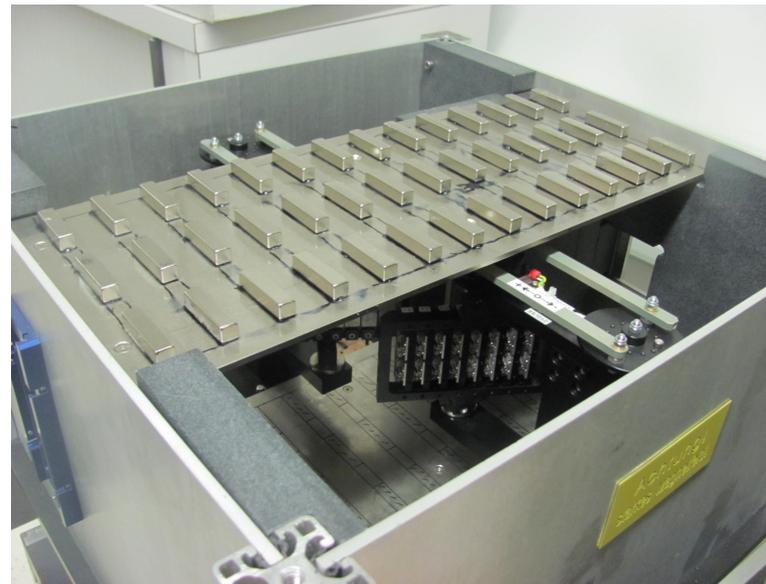
BOA adiabatic spin flipper

Double-monochromator

- BOA double-monochromator was built in 2012 (can be also used for polarized neutron setups)
- Beam size: 40 mm x 40 mm; beam shift 100 mm
- Wavelength range 2.4 – 6 Å
- consists of 2 x 16 crystals -> alignment problem -> two new crystals are planned (together with the imaging group) - > presently: evaluation of crystals
- electronic connections are already improved and tested



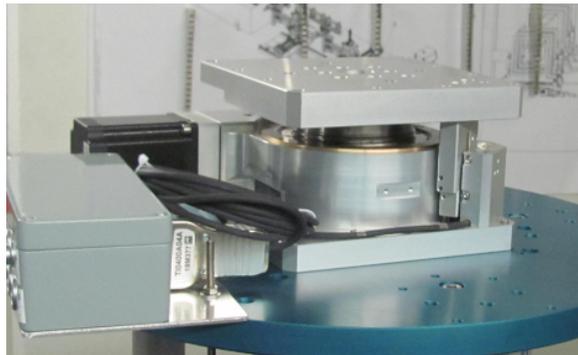
BOA double-monochromator



Inside view of BOA double-monochromator

Additional Equipment I (translations & optics)

- z – translation 40 mm; **NEW** - adaptive optics project
- two linear translation units 400 mm; **NEW** – Selene project
- double focusing lens; quasi-adaptive optics; 4 deg polarization analyzer



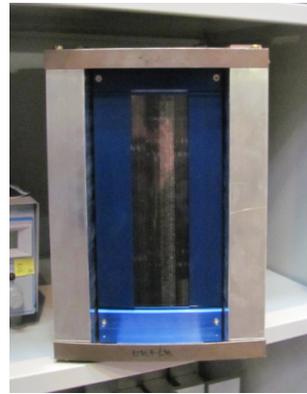
z - translation



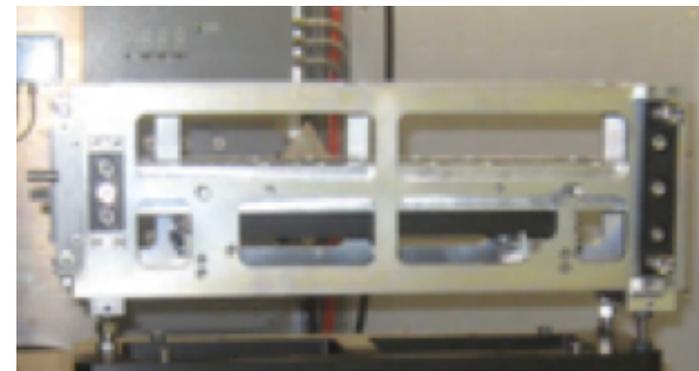
translation units 400 mm



double focusing lens



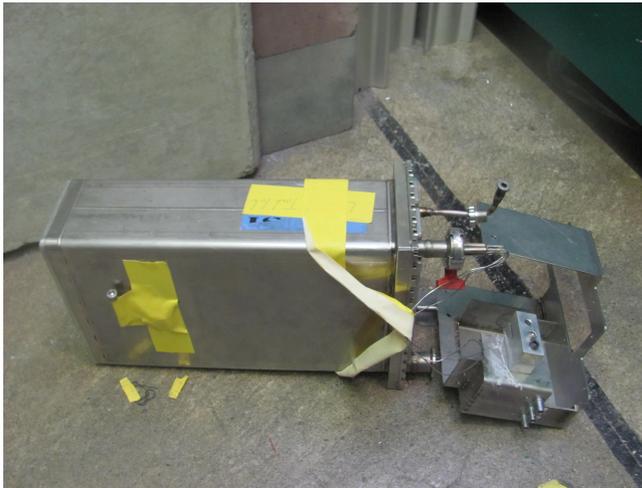
supermirror analyzer



quasi-adaptive optics

Additional Equipment II

- Guide field units - 4 units each 0.5 m long (2012) – 7 units
- Flight tube 2m
- Beryllium filter – defect device from Morpheus used – **new** BOA device is planned in 2013 (budget) – Beryllium block → E. Lehmann ?



Morpheus Beryllium filter



Flight tube

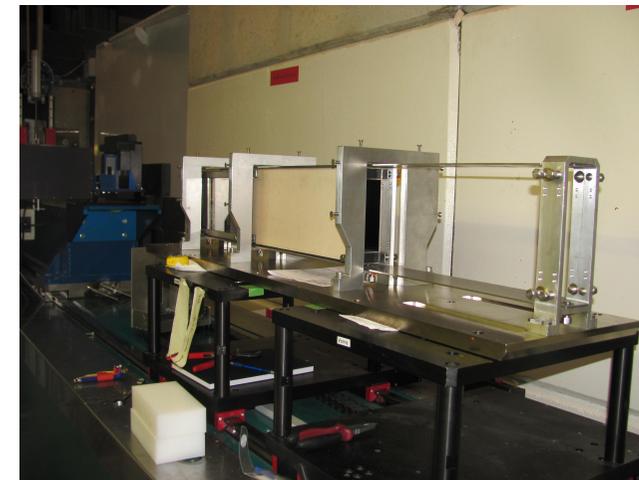
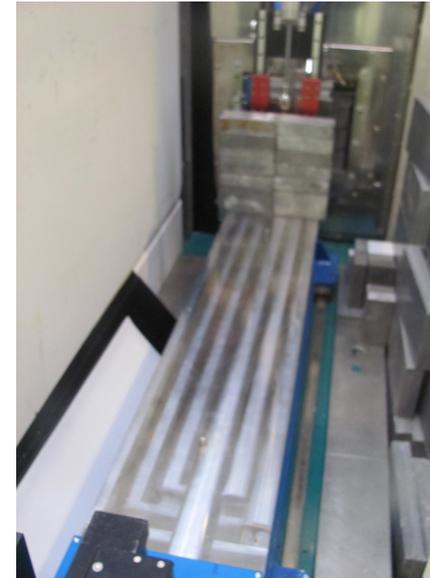


Guide field units

Background reduction – Sapphire Filter

NEW

- Sapphire crystals will be installed during shutdown
- DIM: 155 mm x 60 mm x 85 mm
- Background reduction: more than a factor 6;
neutron flux reduction less than 30 %
- Sapphire filter can be taken out from the beam by a
air pressure system



Present status : guide section taken out

Electronic tasks

- the commissioning of the encoder systems and end switches will be realized until end of April 2013 (JVL motor controller – problems with the provider – absolute encoder !!!)
- MCU3 will be installed for the new chopper system and the high precision aperture
- **NEW** - additional BUS for table 2 & 3
- Tests are planned for the first week of May 2013 (BUS tests plus TOF detector setup)
- general the cabling concept will be improved

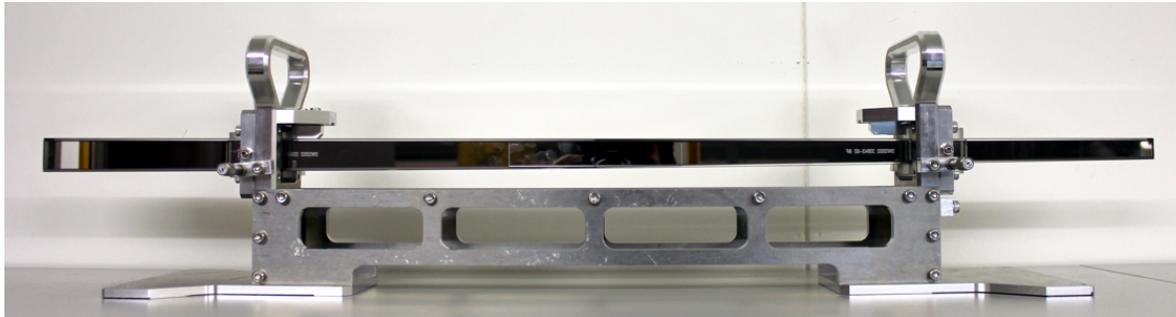


- SICS client (old version)
- SICS client (new version) -> GTSE -> a lot of viewing options are implemented (like imagej); performance and stability improved;
- ImageJ can read now BOA(HDF)-files
- special SICS version for Morpheus PSD-detectors and reflectometer data treatment (Selene TOF option)

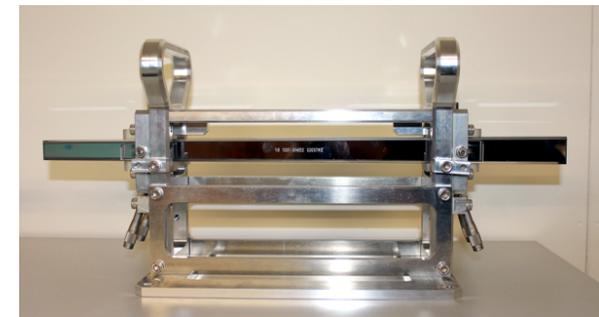
NEW – will be available as standard

- Matlab routines are written for data evaluation
- special server for CCD-camera system is implemented (trigger on monitor)
- BOA web-page in preparation **NEW**
- instruction (trouble shutting) paper is available

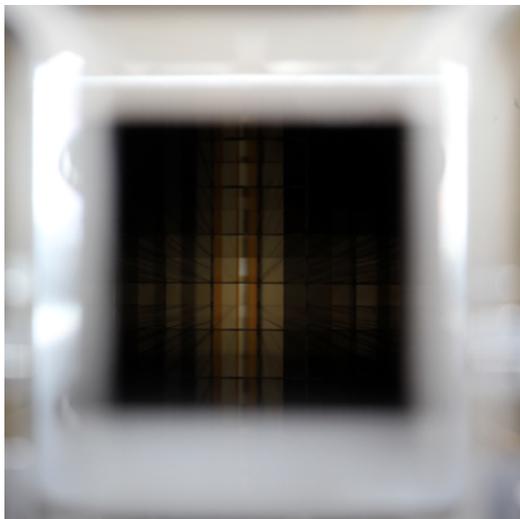
1m focusing parabola (build up from to part of 50 cm)



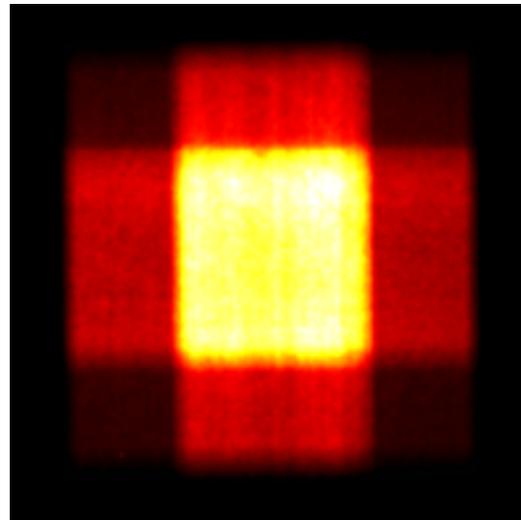
50 cm defocusing parabola



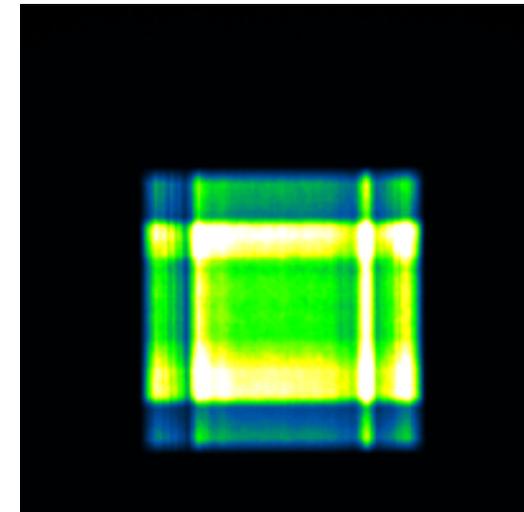
optical view through the lenses



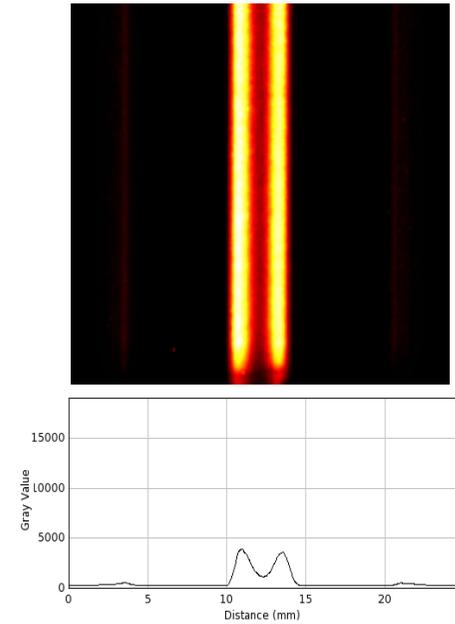
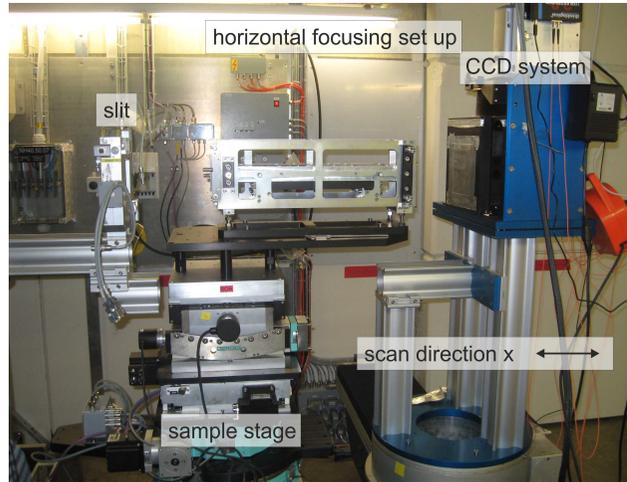
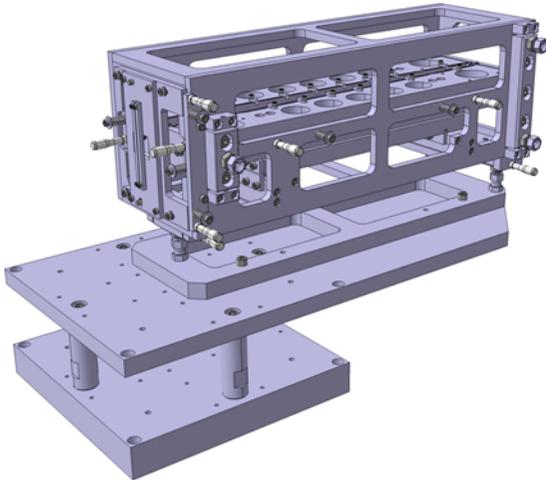
measurement between the lenses



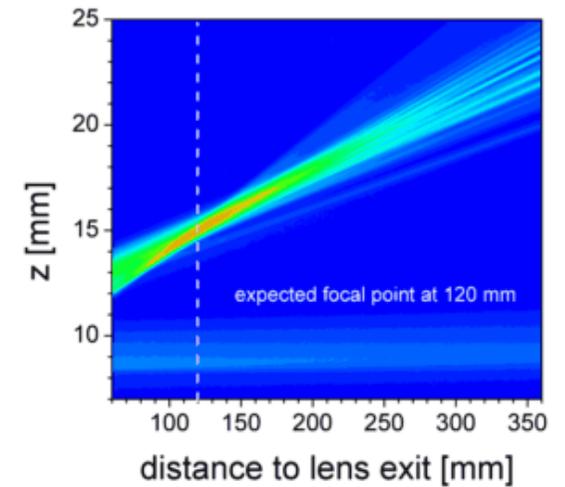
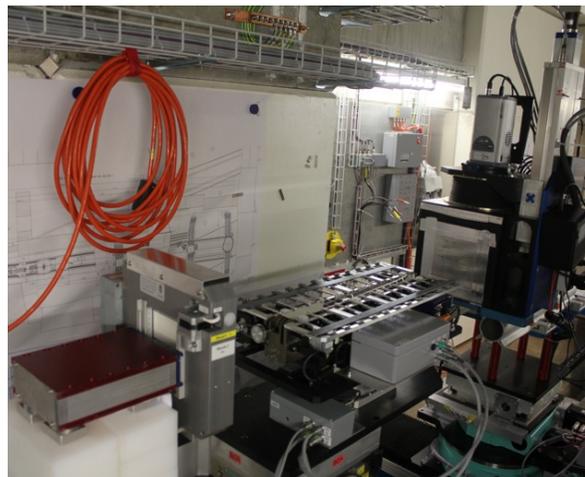
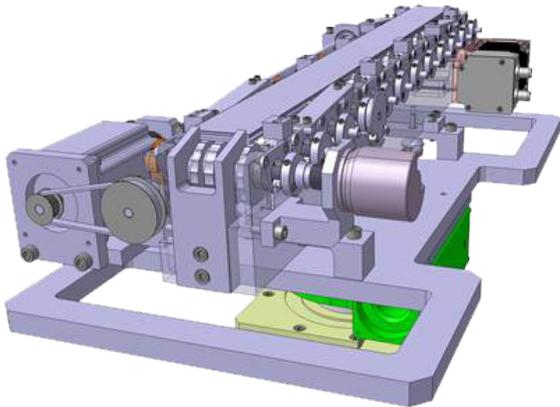
measurement behind defocus-lens



prototype IV : quasi-adaptive optic device (without any actuator)

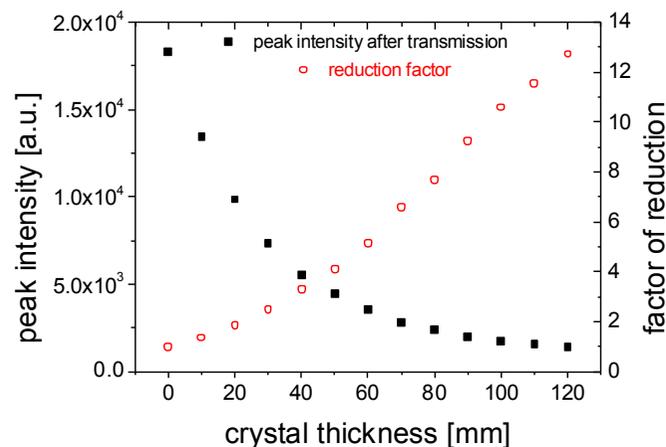
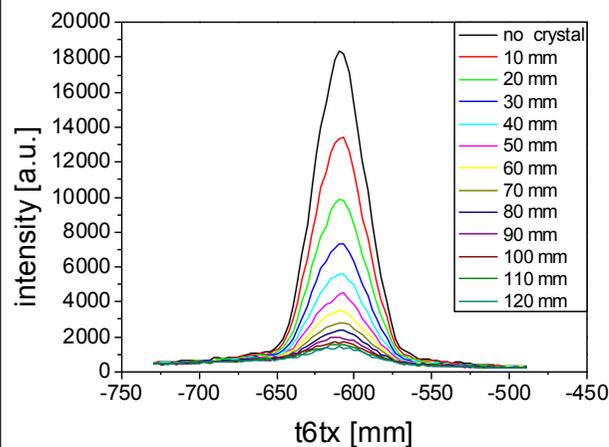


prototype V : adaptive optic device (motorized)

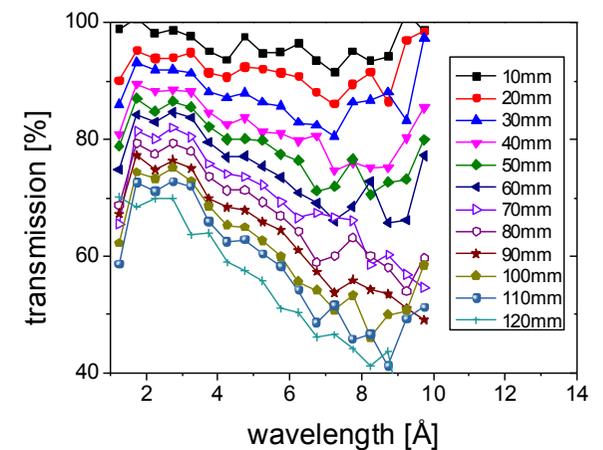




high energy beam (below 0.5 \AA) reduction by different sapphire thicknesses:



useful spectrum reduction

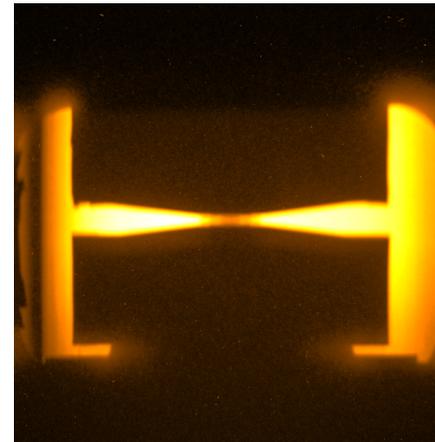


NCCR project : cryostat lens



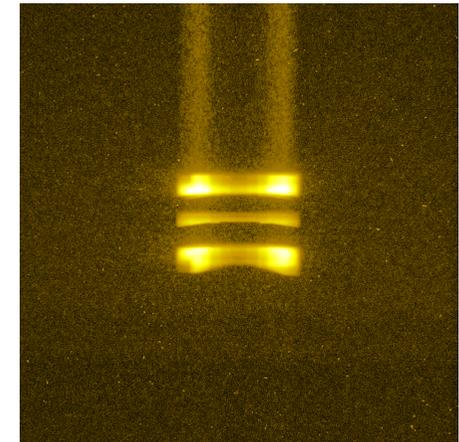
without

pre- adaptive lens

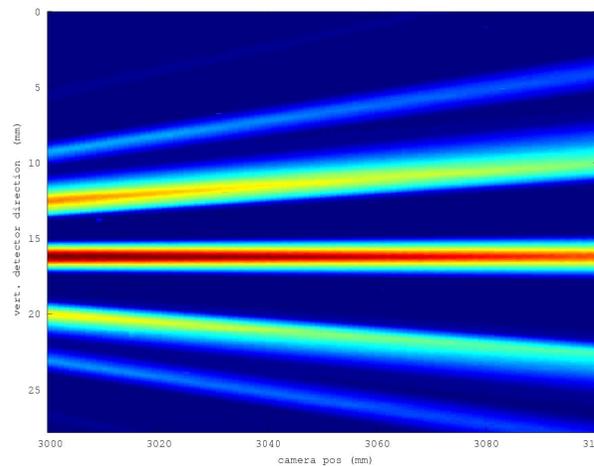


with

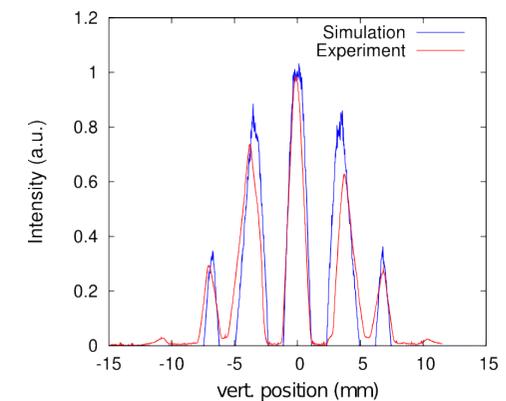
pre- adaptive lens



first test with combining a pre focusing lens with a lens inside the pressure cell



profile at 12 cm behind sample position



- (1) Adaptive optics – prototype V (we had only two days to check the concept)

June 2013 – at least one week

T.Panzner, U.Filges + DTU Denmark

- (2) Cryo-lenses with pressure cell setup – preparation of the DMC experiment (coupled lens setup: quasi-adaptive + cryo-lens)

June 2013 – at least one week

M.Bartkowiak, U. Filges + SwissNeutronics

(1) Compound refractive lenses

May 2013 – at least one week

H.Poulsen; DTU Denmark

(2) Insitu sputtering (with Selene setup)

three weeks

B. Wiedemann & P.Böni; TU Munich

SINQ start : 13th of May

13.5 – 19.05.2013 testing new components with neutrons (spin flipper, PSD detector, sapphire)

20.5 – 26.05.2013 beamline characterisation + background measurements (ESS detector group involved)

27.5 – 2.6.2013

3.6 – 9.6.2013

Block 1: 17.6. – 7.7.2013 (Remark: NOP/ICNS) weekly measurement time

Block 2: 15.7. – 4.8.2013 full block

Block 3: 12.8. – 1.9.2013 full block

Block 4: 9.9. – 29.9.2013 full block

DNP, Selene, insitu sputtering

Block 5: weekly measurement time