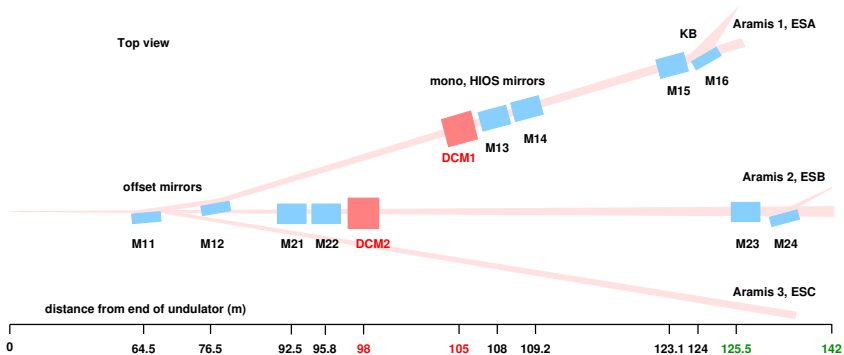




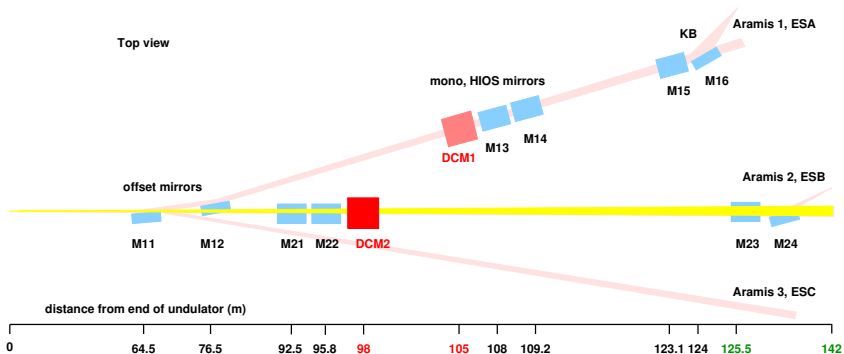
U. Flechsig :: Paul Scherrer Institut

SwissFEL Optics

current status of optics and mechanics, acceptance test



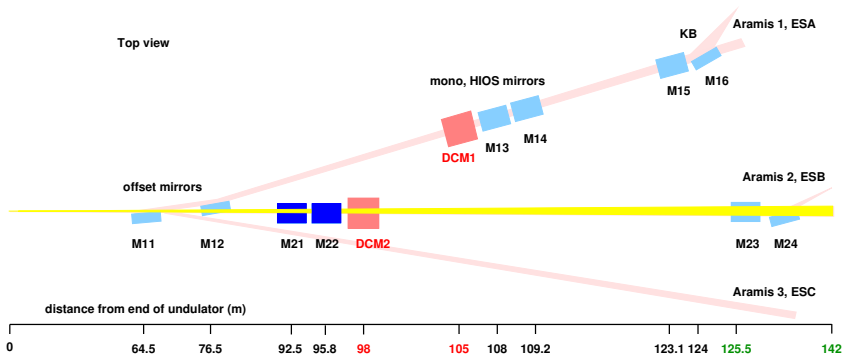
ARAMIS optics layout



ARAMIS optics layout

Operation mode

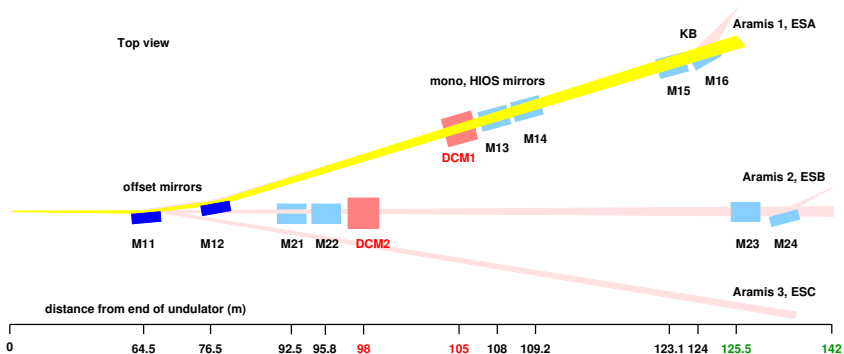
ARAMIS 2 *monochromatic beam*



ARAMIS optics layout

Operation mode

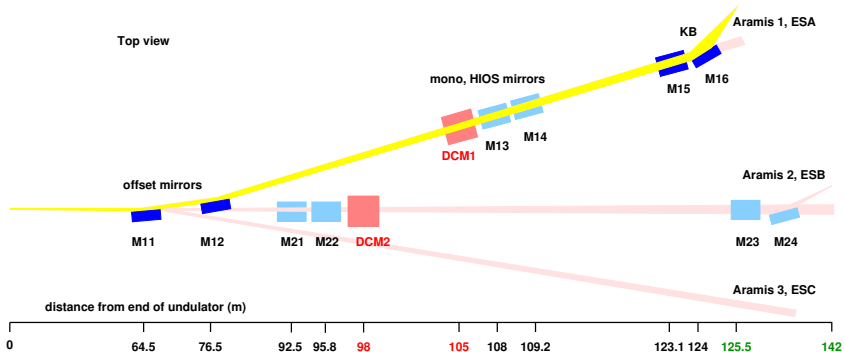
ARAMIS 2 *pink beam*



ARAMIS optics layout

Operation mode

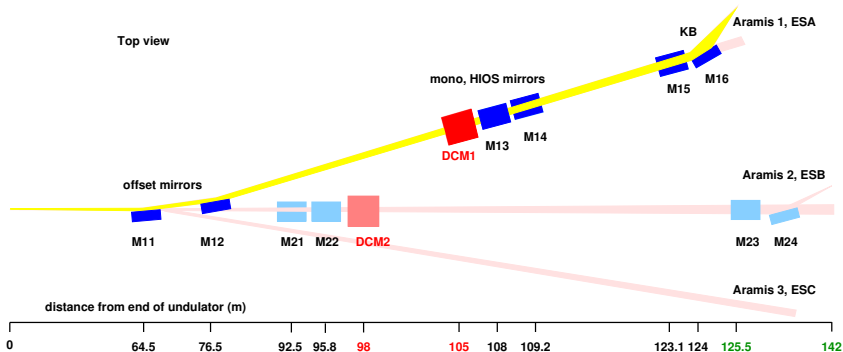
ARAMIS 1 *pink beam*



ARAMIS optics layout

Operation mode

ARAMIS 1 *focused pink beam*

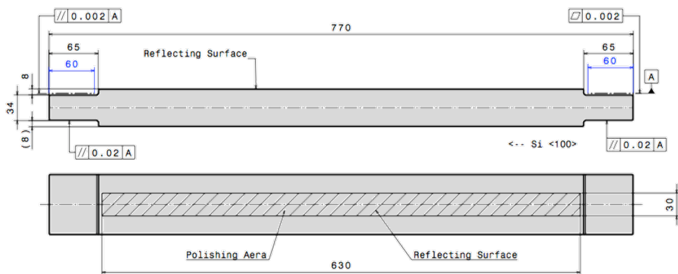


ARAMIS optics layout

Operation mode

ARAMIS 1 *focused monochromatic beam (with HIOS)*

Offset Mirrors (1)



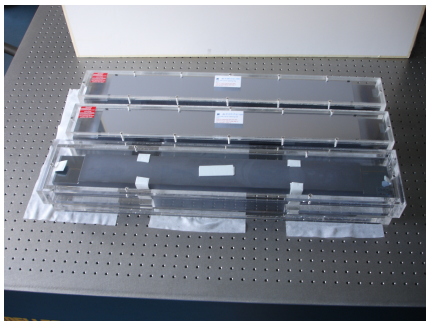
- substrate silicon (100)
- dimensions (770 × 80 × 50(80)) mm
- optical surface (630 × 30) mm
- figure error 0.6 nm rms, 3 nm pv, roughness 0.2 nm rms
- coatings B_4C , Si, Mo + B_4C
- WTO call, contract awarded to Zeiss and JTEC, July 2014



Blanks at supplier (Zeiss, Nov. 14)

- substrate silicon (100)
- dimensions (770 × 80 × 50(80)) mm
- optical surface (630 × 30) mm
- figure error 0.6 nm rms, 3 nm pv, roughness 0.2 nm rms
- coatings B₄C, Si, Mo + B₄C
- WTO call, contract awarded to Zeiss and JTEC, July 2014

6 mirrors, 2 × horizontal, 2 × vertical up, 2 × vertical down, to be mounted in a mechanical bender with 2 actuators



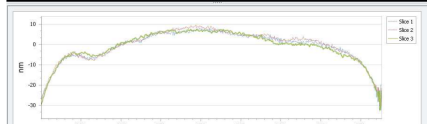
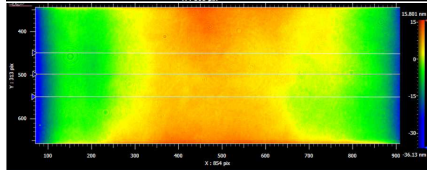
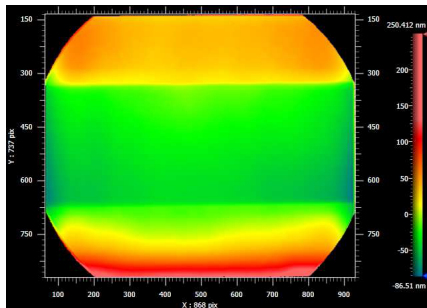
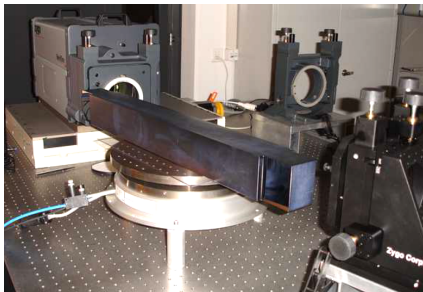
Mar 7, 2016

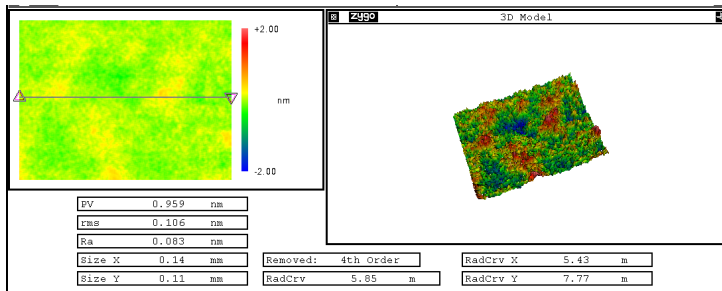
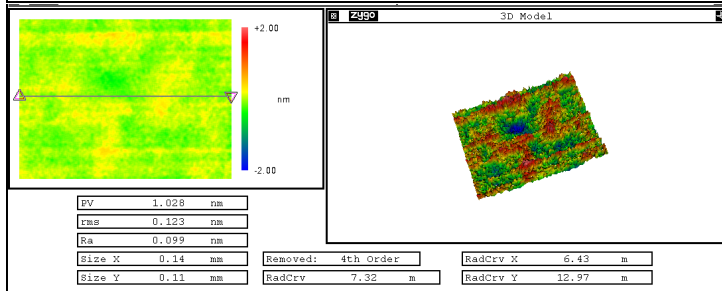


Apr 19, 2016

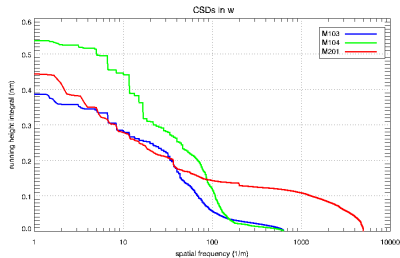
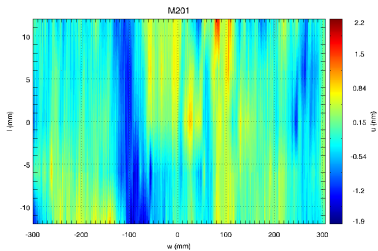
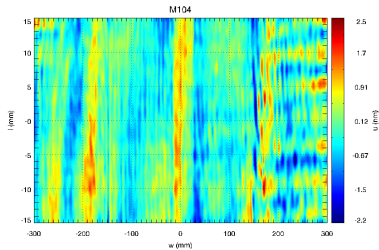
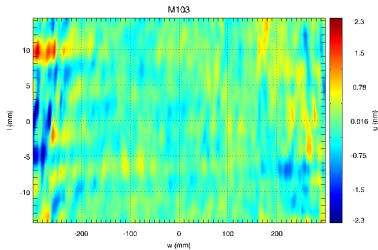
Status

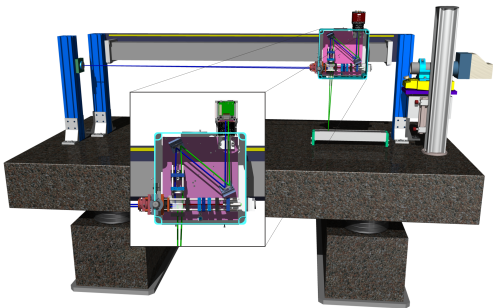
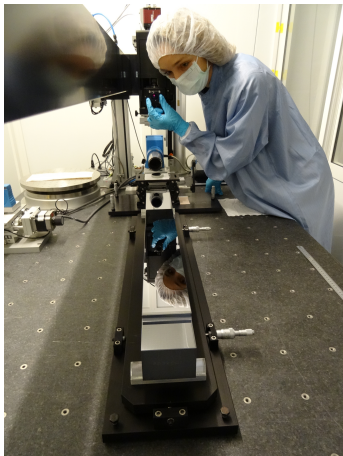
last mirror delivered Aug 2016



M201
JTECM103
Zeiss

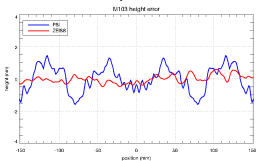
Offset Mirrors - Figure Error - Vendor Data





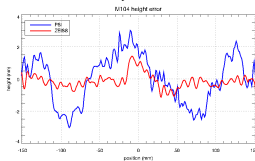
PSI LTP-V, upgraded: motor controller (Parkem), sensor head, detector (PROSILICA AVT GE4900 CCD camera), AKF, EPICS based software

M103, Zeiss



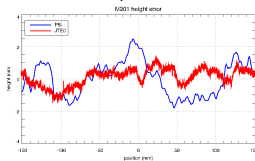
rms: 0.8 nm, pv: 3 nm

M104, Zeiss



rms: 1.5 nm, pv: 6 nm

M201, JTEC

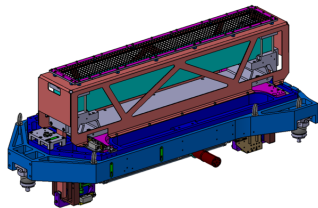
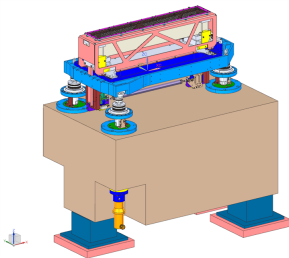
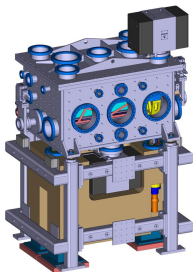


rms: 1.0 nm, pv: 4 nm

- central part, central trace
- estimated error bar ± 1 nm
- our current metrology at PSI is not adequate to quantify the ultimate figure error of these mirrors- we just do quality assurance

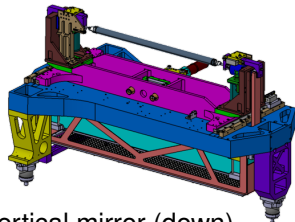
Status

Oct 16: we have 4 Zeiss+ 2 JTEC mirrors measured and coated at PSI ready for installation

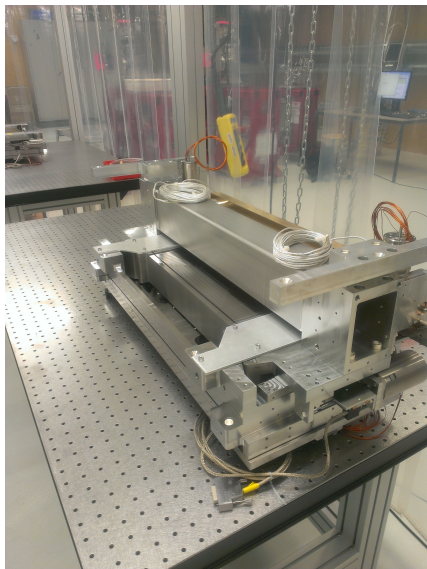
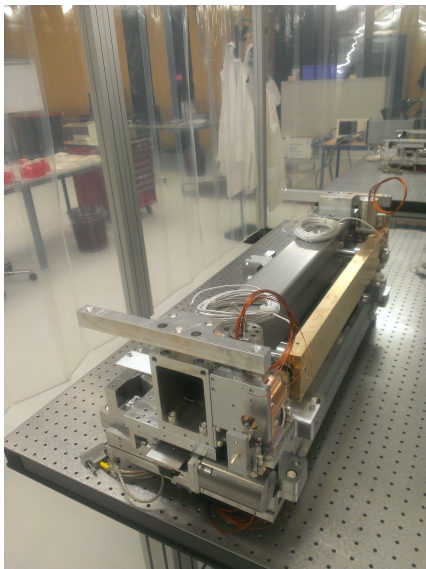


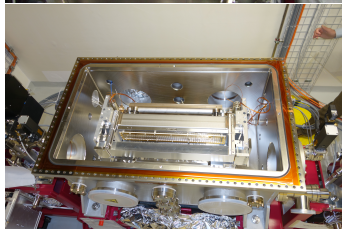
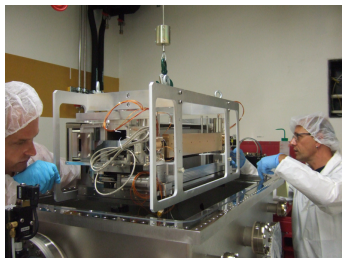
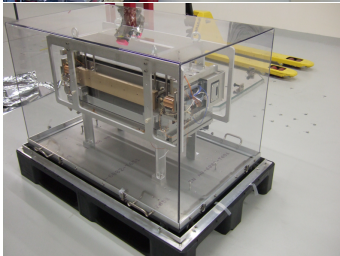
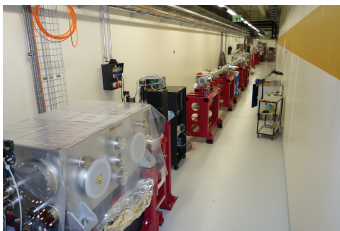
horizontal mirror

- cooperation with DESY - built @ PSI
- delivery fall 2015, 6 units
- bender $R > 2.5$ km
- design originally from PSI, refined by DESY for P11, adapted to ARAMIS by PSI



vertical mirror (down)

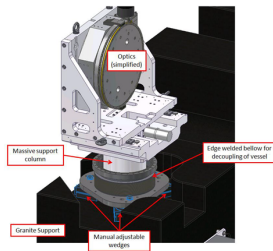
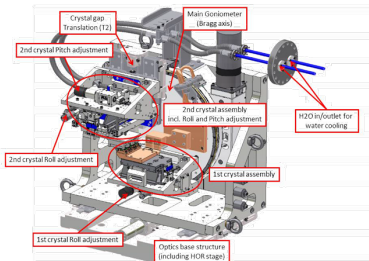
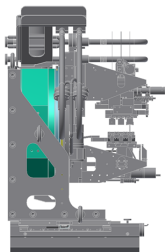




Status

Oct 16: all chambers installed, benders tested with dummies, 2bdone: installation of final mirrors and calibration with LTP

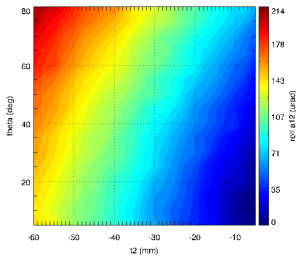
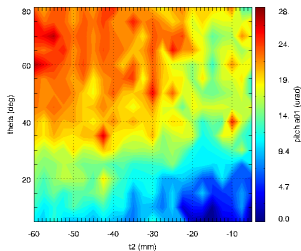
Double Crystal Monochromator (1)



- WTO call, contract awarded to Bruker, April 2014
- delivery by PSI in 2016, 2 units
- Bragg axis: 5 ... 80°
- variable offset: 4 ... 42 mm
- 3 crystal pairs + pink beam

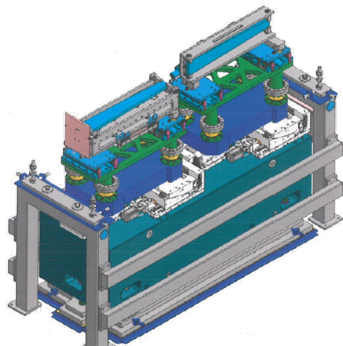
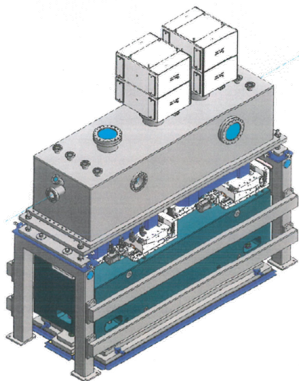
▶ next

Double Crystal Monochromator (2)



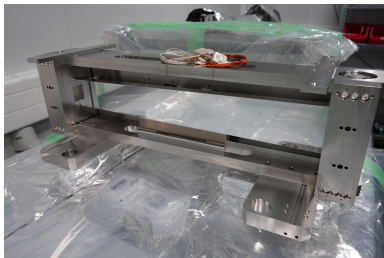
Status

Oct 16: DCM1 installed and tested, DCM2 delivery Nov 2016

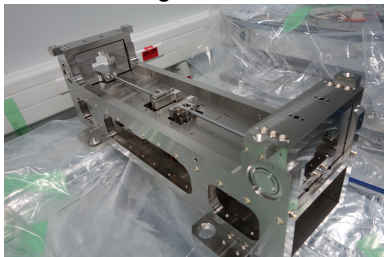


- WTO call, contract awarded to Toyama, May 2015, JTEC mirrors
- delivery fall 2016, 2 units
- usable mirror length 500 mm
- bendable 500 m ... flat

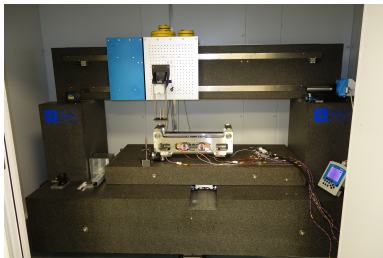
KB Focusing Mirror (2)



hor. deflecting mirror



vert. deflecting mirror details



calibration @ ALBA NOM



chamber delivery Oct 20, 2016



The End

Thank You

PSI site: May 19, 2014