

The end station available on MARS beamline for the second semester 2010

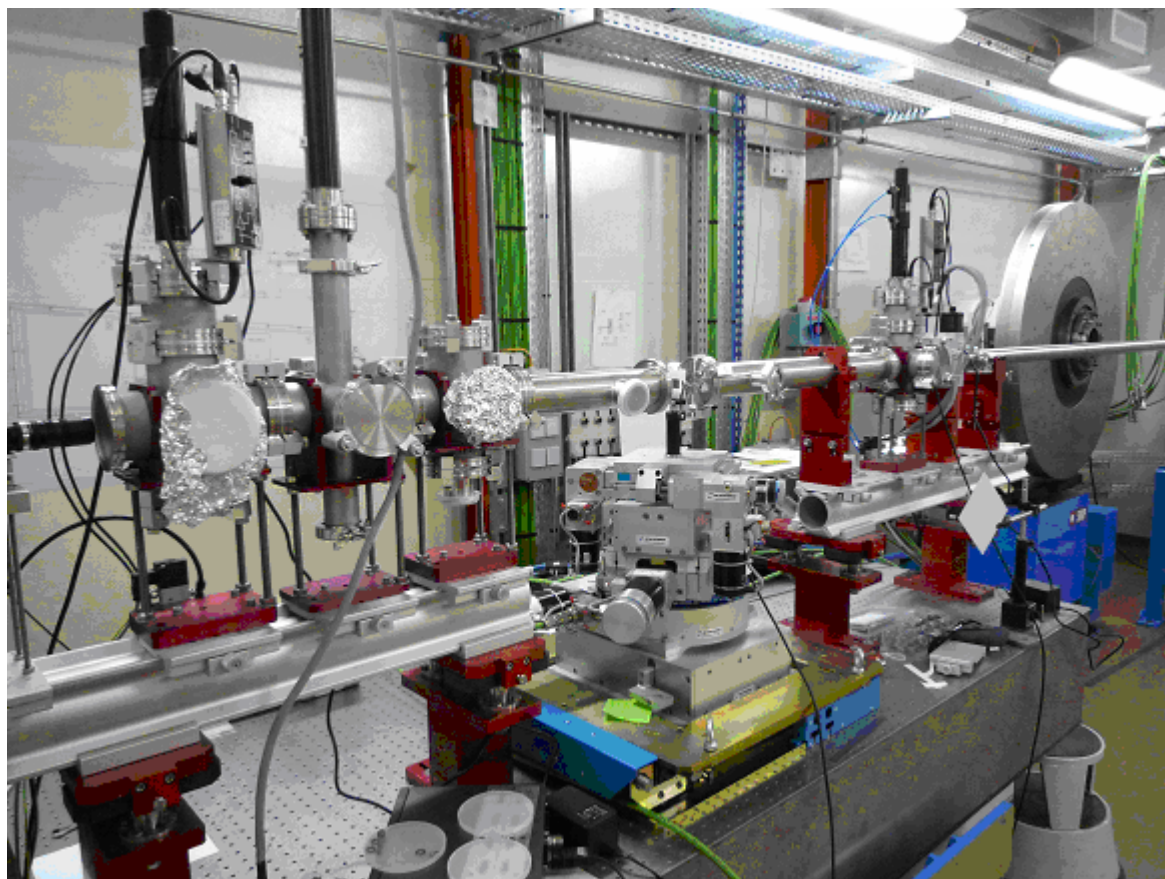
Only one end station on the MARS beamline is ready to accept proposals from external researchers during the second semester of 2010. This station is proposed for standard XAS characterisation (step by step) using transmission or fluorescence mode and for transmission XRD characterisation. The X-ray energy ranges and beam size (FWHM) are the followings:

Selected crystals for the monochromator	Energy range (keV)	standard beam size H (μm) x V (μm)
Si(111)	5 - 20	300 x 300
Si(220)	8 - 35	300 x 300

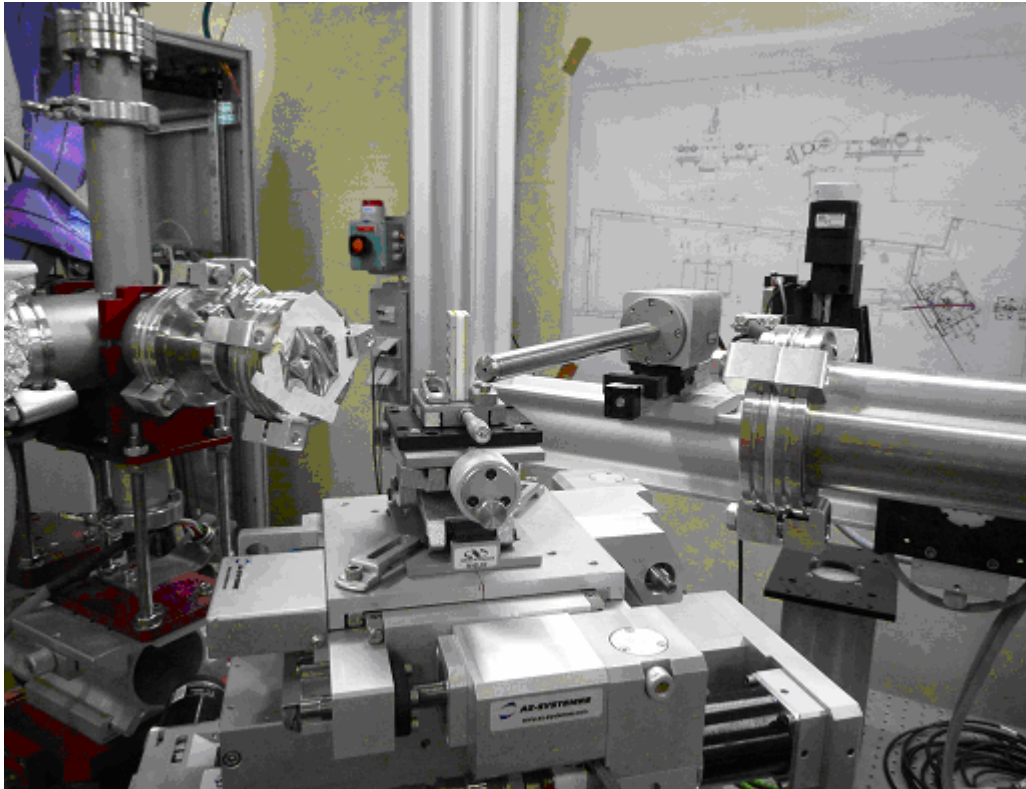
Note that the crystal exchanges Si(111) to Si(220) and vice versa can be done in less than 30 min from our monochromator.

Views of the end station

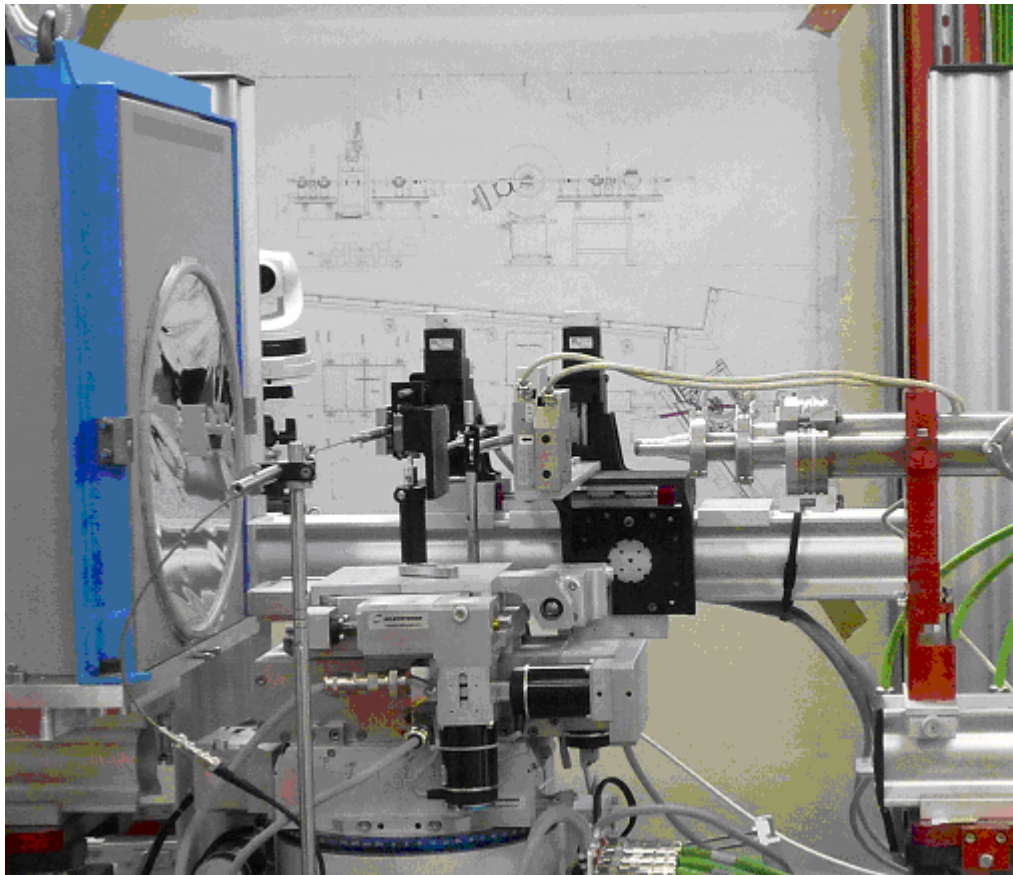
XAS set up : transmission mode



XAS set up : fluorescence mode (here with a single element SDD)



XRD set up (Image Plate MAR345 detector)



Technical details about the multi axis sample manipulator

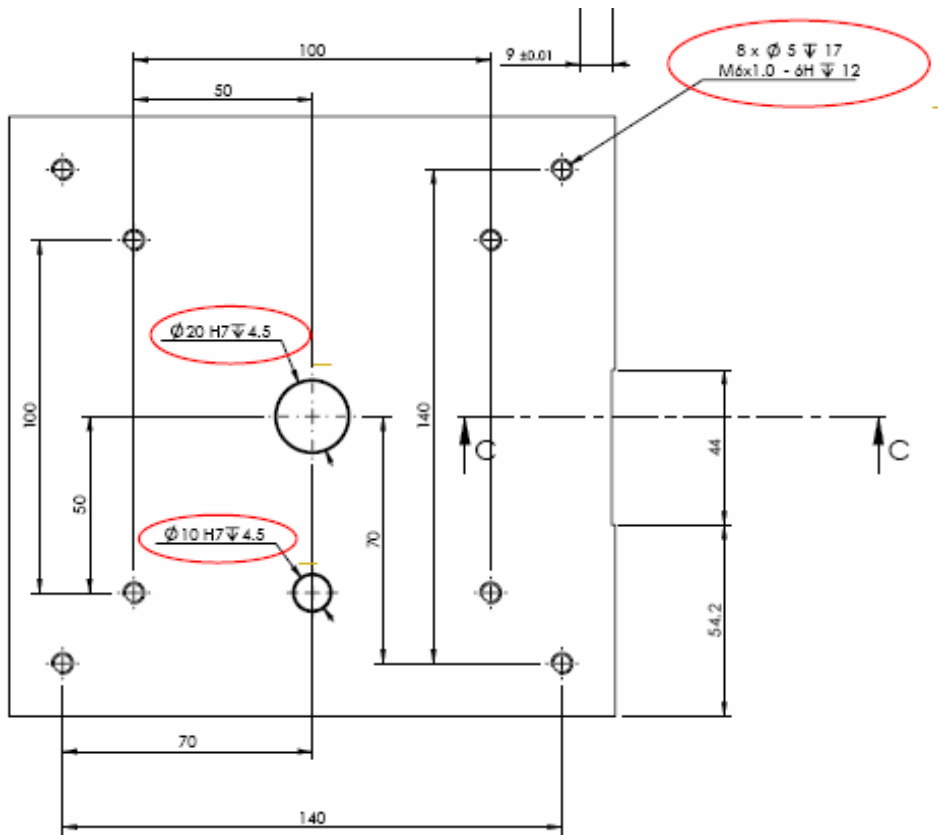
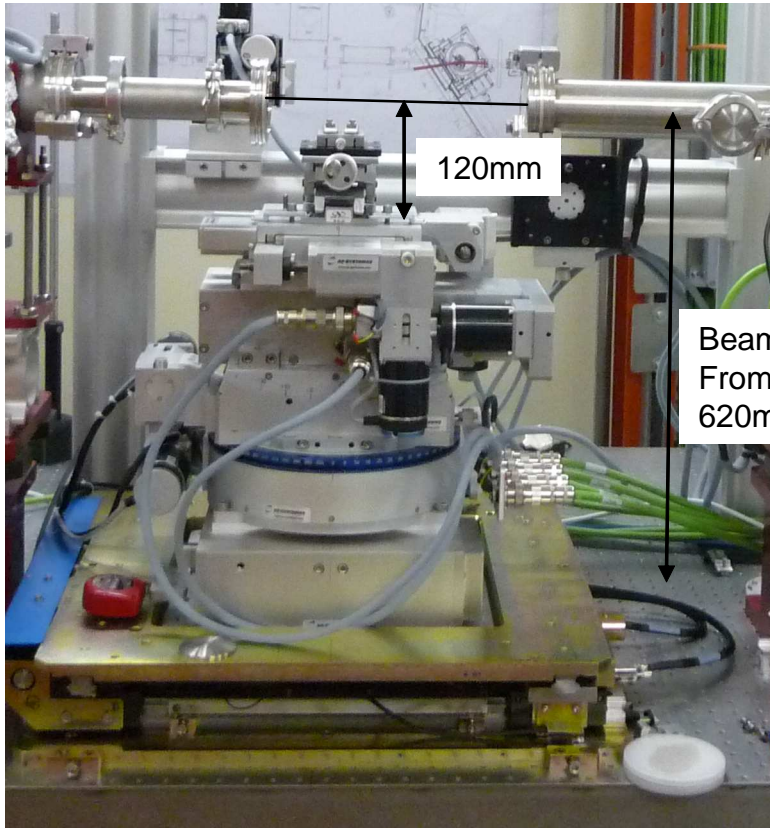
The multi axis manipulator is designed for sample alignment or displacements along the X-ray beam. The motions can be done easily and with a high accuracy using individual stage controllers or from a software sequence developed with the "PASSERELLE" application. In this later case, the sequence has to be written by the local contact before the experiments.

The sample manipulator consists of 8 complementary motorized stages. Starting at the base of the assembly, we find the following motorized stages:

- 1) a horizontal translation stage perpendicular to the X-ray beam (Tx)
- 2) a horizontal translation stage parallel to the X-ray beam (Ts)
- 3) a vertical translation stage (Tz)
- 4) a rotation stage with its axis vertical (Rz)
- 5) a rotation stage with its axis horizontal (Rx)
- 6) a second a vertical translation stage (Tz2)
- 7) a second horizontal translation stage parallel to the X-ray beam (Ts2)
- 8) a second horizontal translation stage perpendicular to the X-ray beam (Tx2)

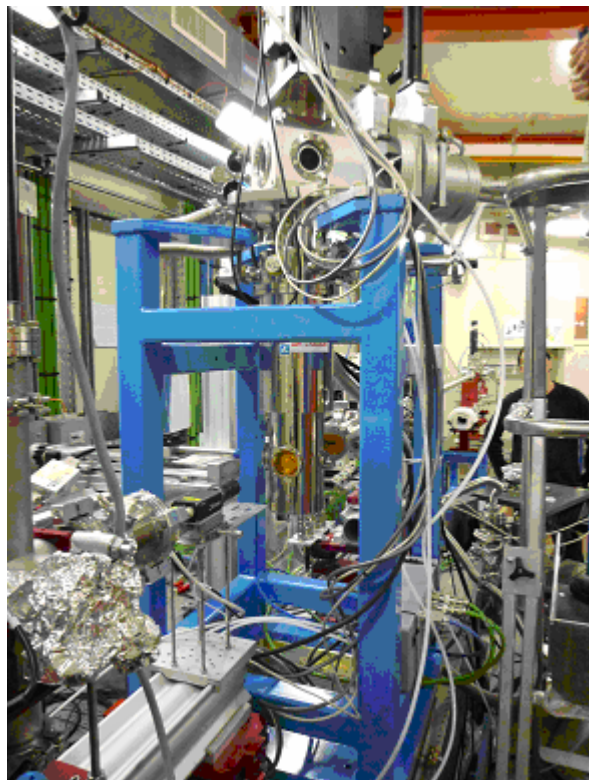
axis	load capacity	Accuracy along the full operating range	Resolution	bidirectional repeatability
Tx	250 kg	5 μm over 40 mm	0,5 μm	1 μm
Ts	250 kg	5 μm over 40 mm	0,5 μm	1 μm
Tz	50 kg	2 μm over 20 mm	0,5 μm	1 μm
Rz	50 kg	range 360°	0,001°	0,005°
Rx	50 kg	range $\pm 15^\circ$	0,005°	0,01°
Tz2	25 kg	2 μm over 20 mm	0,05 μm	0,2 μm
Ts2	25 kg	2 μm over 20 mm	0,05 μm	0,2 μm
Tx2	25 kg	2 μm over 20 mm	0,05 μm	0,2 μm

Different sample holders can be easily fixed directly on the top of the manipulator from several threads (M6) as shown on the drawing of the interface plate X-S (see below). Also you have to note that the standard distance between the top of the goniometer and the synchrotron beam is equal to 120 mm. Also to adjust rapidly your sample on the centre of the interface plate X-S (or along the axis of rotation Rz), you can use the normalized drilling $\varnothing 20$ H7. Note that its deepness is limited to 4.5 mm.

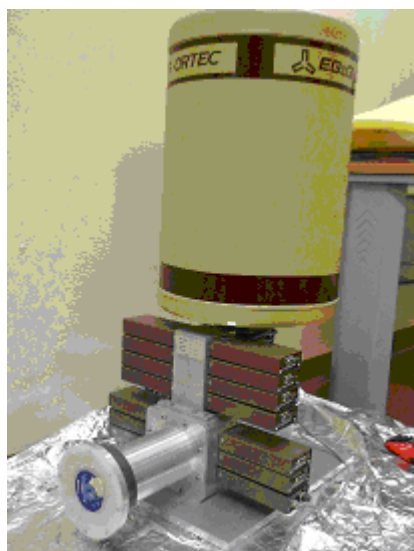


Additional equipment

A liquid helium cryostat can be used instead of the multiaxis stage for low temperature measurements (down to at least 10 K). Both transmission and fluorescence measurements can be performed. Please contact beamline staff for details on sample-holder.



A multi-element HP Germanium detector (Ortec) is available for fluorescence measurements in combination with digital electronics (XIA). (besides SDD detector provided by Detectors Group).



A motorised stage for multi-samples sample-holder will be available (up to 12 samples).