G 5-bis Very Small Angle Neutron Scattering facility TPA

Beam tube ………………………….... Neutron bender 50*25mm^2 on G5 guide
Monochromator …………………………..Double reflection supermirror monochromator
                                   $5 < \lambda < 15$ Å, $\Delta\lambda/\lambda_{FWHM} = 11\%$
Type of instrument ……………………….**V**ery **S**mall **A**ngle **S**cattering Diffractometer
Max. beam size at specimen …………..40 x 25mm^2. Typical size Ø~25mm
Range of momentum transfer …………..$2\times10^{-4} < Q < 10^{-2}$ Å^{-1}
Angular range ……………………………0.14 < Q < 7 mrad
Sample – detector Distance …………….1 < D < 6 m
Collimation ………………………………Multibeam pinholes or slits converging at 6m distance.
                                    Mutilbeam pinholes converging at 1m or 4m distance.
                                    Single pinhole collimation.
Detector ………………………………… XY Image plate, 345mm diameter
                                   2300 *2300 pixels, each 0.15 x 0.15 mm^2
Data collection and
Instrument control system ………………PC and windows operating system.

Ancillary equipment   Double goniometer (+-20°), sample rotation (350°)
                                 Heavy load rotation table and elevator.
                                 Sample changer (8 positions) with
                                 temperature control (10°C ; 80°C).
                                 Electromagnet (1.2T max)
                                 Cryomagnet (7T max possible. Ask local contact)
                                 For other LLB SANS equipments ask local contact.

TPA is a **V**ery **S**mall **A**ngle **N**eutron **S**cattering spectrometer installed at the extremity of a bender (G5-bis) from guide G5. It allows to reach very low Q values down to 2 10^{-4}Å^{-1} (@15 Å).

The highest X-Y resolution is achieved by using the multi-beam converging pinhole technique for collimation. It consists in a set (13) of masks with numerous (~350) tiny (~1mm diameter) holes producing equivalent number of converging beams on to the detector. In addition of the entrance and exit masks, 11 anti overlap masks are required along the collimator to avoid cross-talks.

For isotropic scattering, multi-slits collimation is available: it allows to gain a factor 50 in intensity, while loosing information along the vertical (Y) direction. Deconvolution will then be required. Two other sets of masks will be available for converging beams at 1m and 4m sample to detector distances.

Measurements are performed with a monochromatic beam, in the range 5 -15 Å with a distribution $\Delta\lambda/\lambda$ of 11%. To reduce the spectrometer length and gain intensity, the double reflection supermirror monochromator is located inside the collimator.

The XY detector is a high resolution circular image plate made of 2300*2300 pixels of 0.15 x 0.15 mm^2. The overall diameter of the detector is 345 mm. It is located inside a tank filled with helium gaz.

The sample to detector distance can be varied in between 1 and 6.5 m.

Data acquisition is achieved by electronic devices controlled by PC windows connected to the network. Data files are text XML files. Data treatments can be done with the LLB software, PAsiNET.MAT.
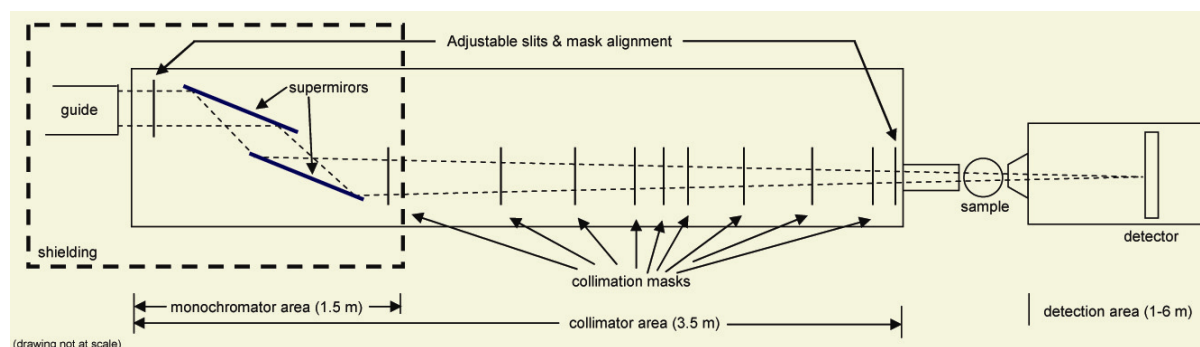
Schematic layout of TPA

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