

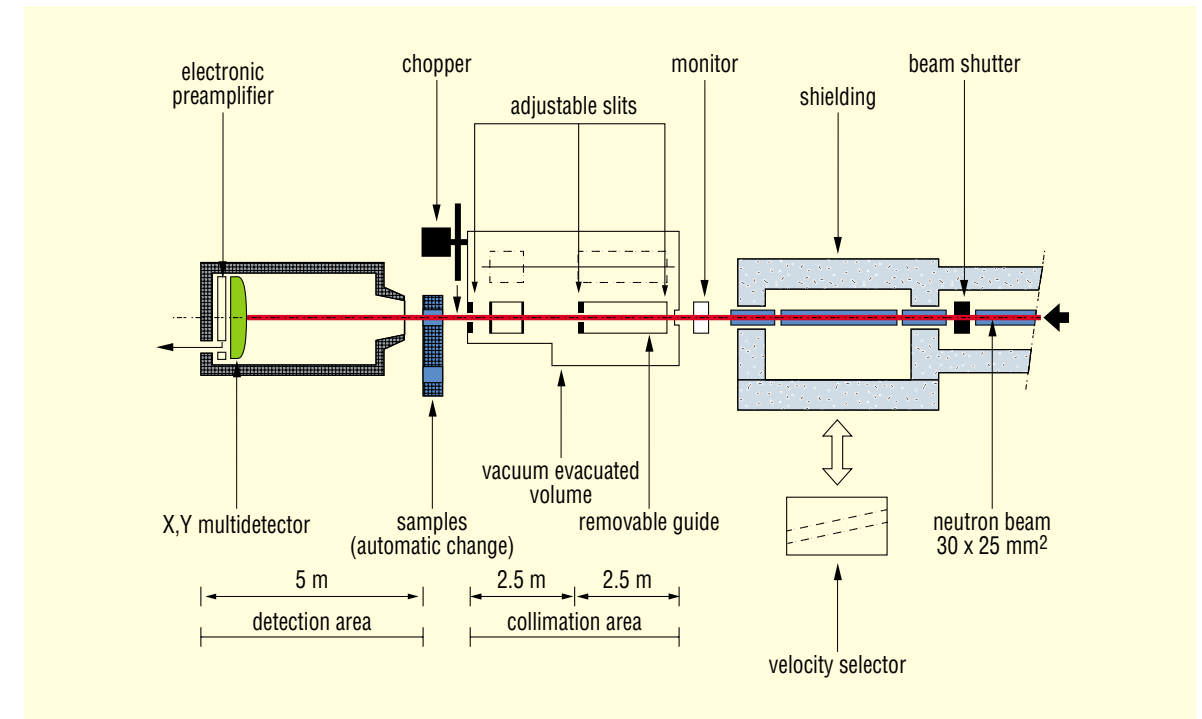
Beam tube .....	Neutron Guide G5 (cold source)
Monochromator .....	Mechanical selector
Type of instrument .....	Small angle scattering diffractometer
Typical flux at specimen .....	$7 \times 10^5 \text{ n cm}^{-2} \text{ s}^{-1}$
Max. beam size at specimen .....	2.5 x 3 cm <sup>2</sup>
Range of momentum transfer .....	Usually, circular with $\varnothing = 7 \text{ mm}$
Angular range .....	$2 \times 10^{-3} < Q < 0.5 \text{ \AA}^{-1}$ (monochromatic beam)
Distance sample - detector .....	$1 \times 10^{-3} < Q < 0.5 \text{ \AA}^{-1}$ (time of flight)
Collimation .....	6 x 10 <sup>-3</sup> to 0.8 rad
Detector .....	0.8 < D < 5 m
Data collection and Instrument control system .....	Adapted to sample-detector distance, through a movable neutron guide element.
Ancillary equipment	BF <sub>3</sub> , XY multidetector, 64 x 64 cm <sup>2</sup> with 4000 cells, each 1 x 1 cm <sup>2</sup>
	Microcomputer PC
	★ Automatic sample changer (16 positions) with temperature control (-43 < T < 100°C).
	★ Cryostat 4 < T < 370 K
	★ Magnet H < 2 T
	★ Furnace (50 < T < 300°C)
	★ Displex (10K)

PAXE is a small angle scattering instrument installed at the extremity of the guide G5, which is a straight guide coated with <sup>58</sup>Ni. There is a XY position sensitive detector. Measurements can be performed :

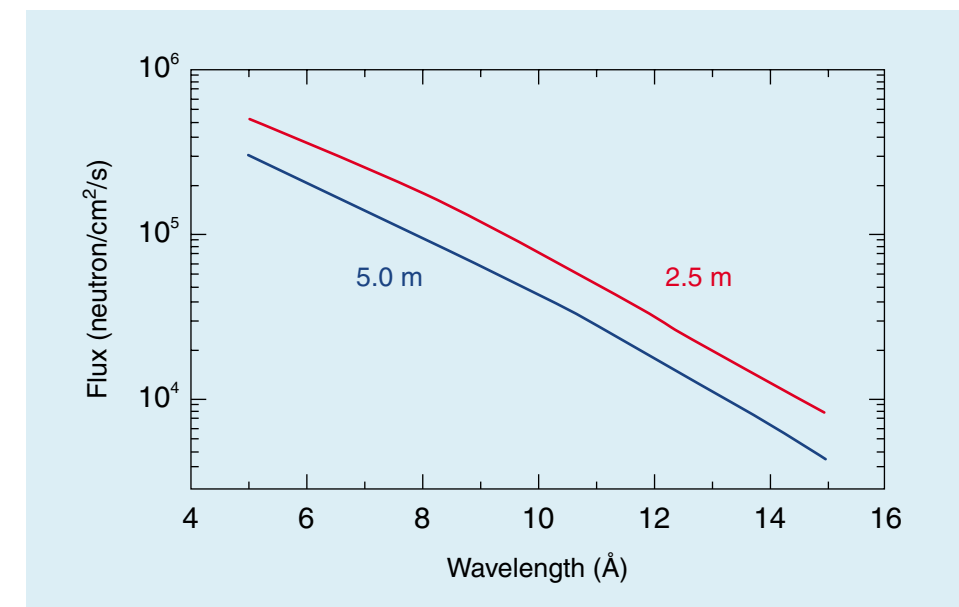
- with a monochromatic beam ( $4 < \lambda < 25 \text{ \AA}$ ), using a velocity selector. The wave-length resolution ( $\Delta\lambda/\lambda$ ) can be chosen between 5 and 15%.
- with a polychromatic beam (time of flight method) using a chopper.

The XY detector, filled with BF<sub>3</sub> contains 64 x 64 cells of 1 x 1 cm<sup>2</sup>. It is mounted on a moveable trolley placed within a cylindrical tube kept under vacuum. The sample to detector distance can be chosen between 0.8 and 5 m.

The numerical values on the table above show the ranges of wavelength and distance. They yield a Q range extending from  $3.10^{-3}$  to  $0.5 \text{ \AA}^{-1}$  ; smaller values of Q (down to  $10^{-3} \text{ \AA}^{-1}$ ) may be reached using the time of flight technique. Collimation is achieved by two circular slits at the two extremities of a tube under vacuum. The collimation length is equal to either 2.5 or 5 m. For a collimation of 2.5 m, a neutron guide is inserted before the collimation section, in order to maximise the flux. The figure below depicts the total neutron flux at sample position for different wavelengths and distances of collimation, assuming  $\Delta\lambda/\lambda = 10\%$ . The data acquisition is done by electronic devices controlled by PC computers connected to the network of the laboratory.



General layout of the spectrometer G 5-4.



Incident flux on sample.

Responsibles : J. Teixeira  
G. Pepy

e-mail : teixeira@llb.saclay.cea.fr  
e-mail : pepy@llb.saclay.cea.fr