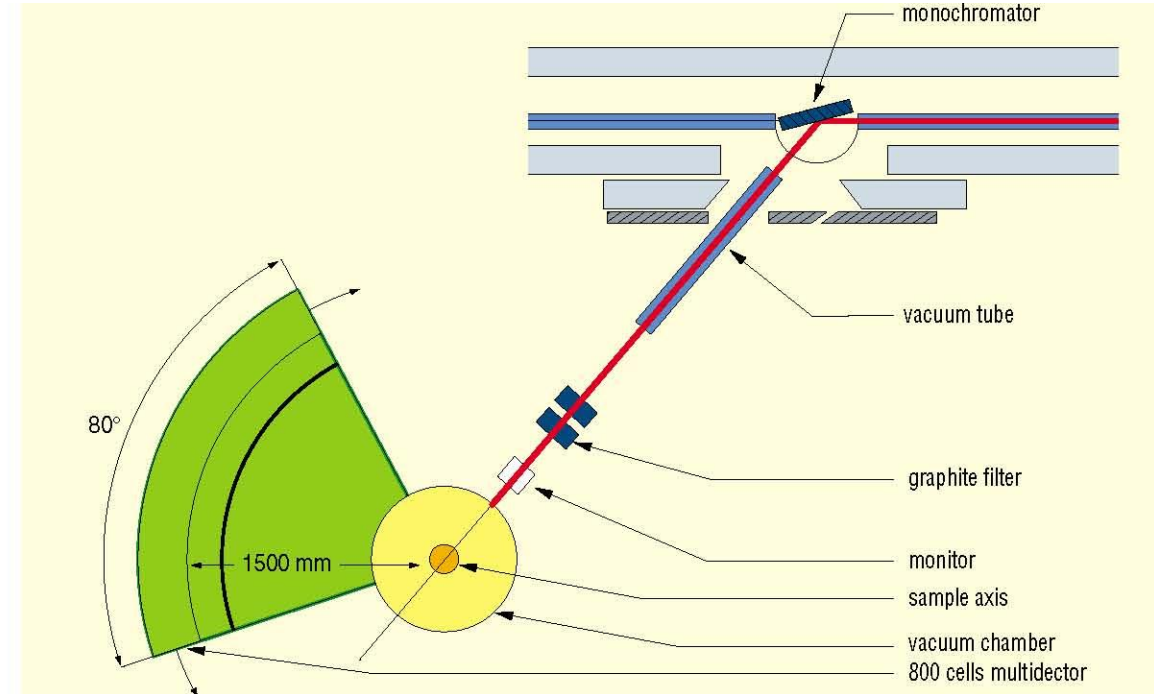


Type of instrument	Two-axis diffractometer
Beam tube	Cold neutron guide G 4
Monochromator	Pyrolytic graphite (002), vertical focusing
Take-off-angle	$42 < 2\theta_M (^{\circ}) < 110$
Incident wavelength	$2.43 < \lambda (\text{\AA}) < 5.5$
Max. flux at specimen	$4.10^6 \text{ n cm}^{-2} \text{ s}^{-1}$ ($\lambda = 2.43 \text{ \AA}$)
Max. beam size at specimen	$10 \times 50 \text{ mm}^2$
Detectors	Linear multidetector 800 cells (BF_3)
Minimum step size scan	0.02° (2θ)
Angular range	$3 < 2\theta (^{\circ}) < 105$
Angular resolution	See figure
Data collection and Instrument control system	PC computer

<u>Ancillary equipment</u>	
★ Cryofurnace $1.5 \text{ K} < T < 550 \text{ K}$	
★ Furnace $T < 1000^{\circ}\text{C}$	
★ High (hydrostatic) pressure cell : $P < 23 \text{ Kbar}$	
★ Vertical magnetic field : $H < 1.5 \text{ T}$	



General layout of the cold neutron two axis diffractometer G 4-1.

G 4-1 is a two-axis powder diffractometer equipped with a vertical focusing pyrolytic graphite monochromator and a 800-cells multidetector covering a 80° -2θ range (step 0.1° between 2 cells).

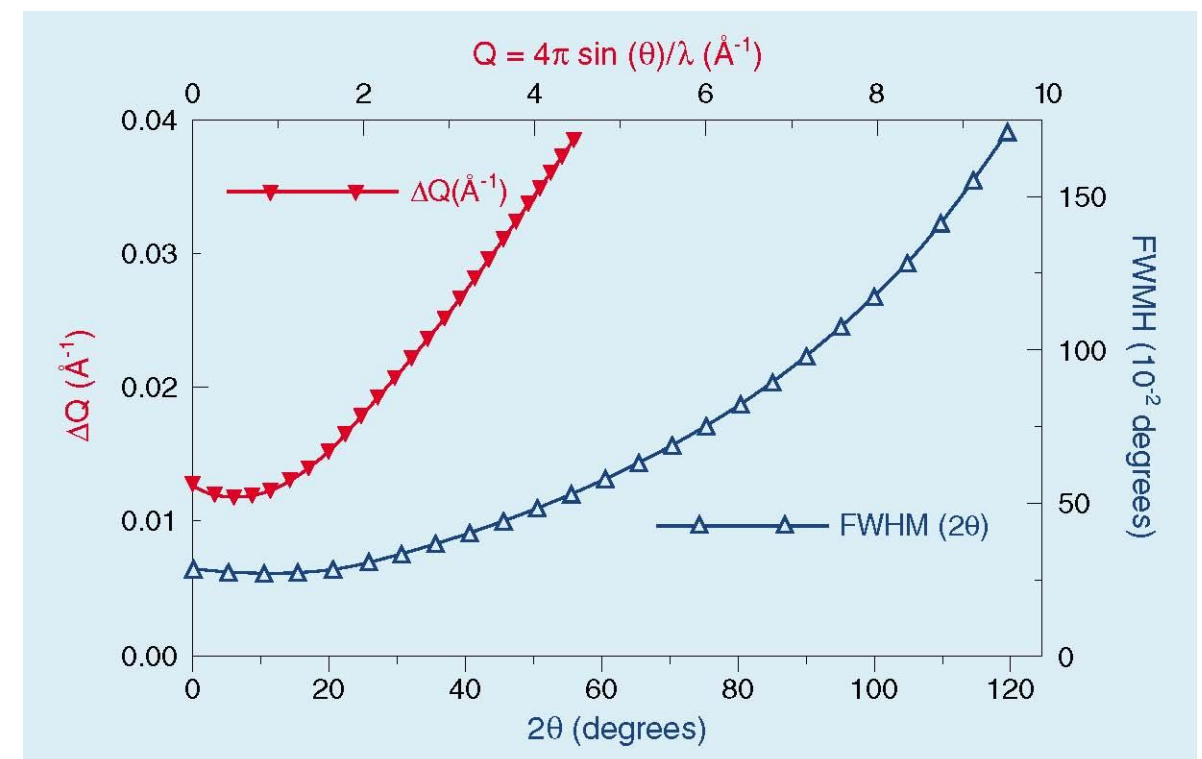
The most frequently used wavelength is 2.43 \AA but can occasionally be varied between 2.43 and 5.5 \AA . The accessible 2θ diffusion angle covers the range $3^{\circ} - 105^{\circ}$; in that range it is possible to perform diagrams with 0.02° step (2θ).

The instrumental resolution of the spectrometer being minimal at low 2θ diffusion angle ($2\theta < 60^{\circ}$), G 4-1 is particularly well adapted for magnetic structure determination.

The high acquisition rate of the multidetector allows to perform diffraction studies (structural or magnetic) as a function of external parameters (temperature, pressure...) and to follow in situ cinetic reactions or phase transitions; the minimal acquisition time is of the order of one minute. With longer acquisition time (a few hours) it becomes possible to detect and quantify minority phases present in a multiphase compound, generally down to 0.1% (weight percentage).

Soon available :

- dilution cryostat down to 50 mK .



Resolution curves :

Full width at half maximum (FWHM) versus 2θ ; \blacktriangledown variation of the resolution ΔQ ($\lambda = 0.245 \text{ nm}$).

Responsible : F. Damay

e-mail : francoise.damay@cea.fr