

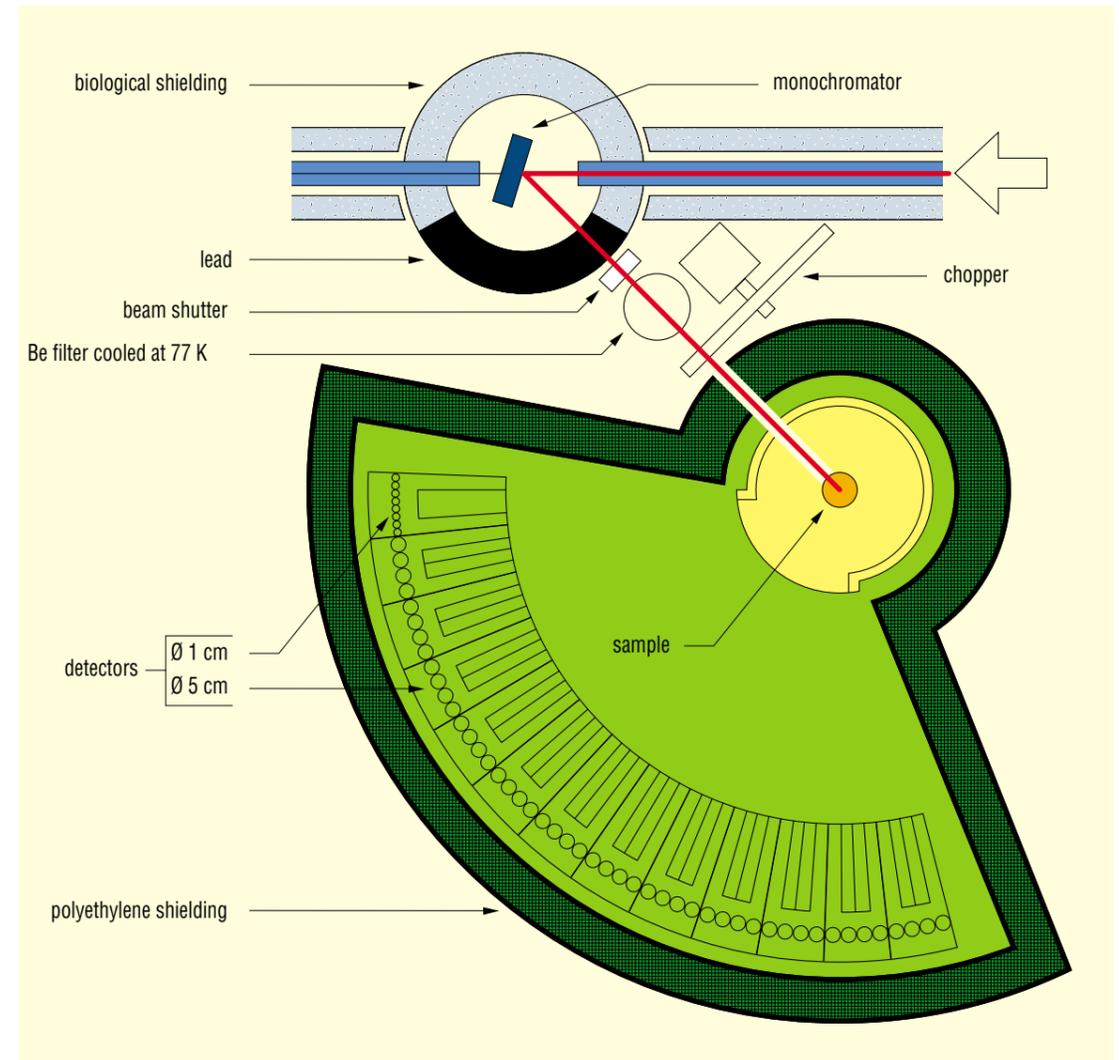
Beam tube	Cold neutron Guide G 4
Monochromators	Graphite, 5 slabs (80 x 30 x 2 mm), vertical focusing Mosaicity 0.8°
Type of instrument	Diffractometer.
Max. flux at specimen (n/cm ² .s)	1.3 x 10 ⁶ ($\lambda = 5.6 \text{ \AA}$)
Max. beam size at specimen	25 x 50 mm ²
Incident wavelength	2.4 < λ (\AA) < 6 $\Delta\lambda/\lambda = 4.10^{-2}$
Incident energy	12 > E (meV) > 2.2
Energy resolution	8 to 0.5 meV
Angular resolution	2.5° or 0.625°
Angular ranges	-5° < 2 θ < 140°
Scattering vector ranges	0.1 < Q (\AA^{-1}) < 5
Collimation	Monochromator-sample distance : 1.8 m ($\lambda = 5.6 \text{ \AA}$) Sample-detector distance : 1.5 m
Detectors	64 ³ He detectors (48 + 16)
Background	1 c/min detector
Data Collection and Instrument Control System	PC
<u>Ancillary equipment</u>	★ Furnace (T < 1300°C) ★ Cryostat (1.5 < T < 300 K)

This instrument is dedicated to the study of disorder in solids, in particular in metallic alloys : short range order, size effects, impurity effects. The sample is a polycrystal or a single crystal oriented outside the instrument.

The incoming beam is monochromatic (2.4 < λ < 6 \AA). The focusing monochromator, made of 5 graphite blades, concentrates the beam on about 6 cm at the sample level, with a flux increase by a factor of 2 or 3. A nitrogen cooled beryllium filter ($\lambda > 3.96 \text{ \AA}$) eliminates $\lambda/2$ harmonic of the incident beam.

A vacuum vessel around the sample, 80 cm diameter, minimizes the background due to air scattering and includes a furnace for in situ high temperature experiments. An automatic sample translator enables to compare various samples, including a vanadium standard and a background without sample. For single crystal studies, an automatic rotation of the sample is provided, in order to explore the diffuse scattering in a whole plane of the reciprocal space.

The measuring system is made of 48 ³He detectors, 50 mm in diameter, and a block of 16 (10 mm in diameter), which can be rotated by $\pm 5^\circ$ around the sample axis.



General layout of the diffractometer G 4-4.

The experiment is equipped with a PC which enables to position the instrument, collect the data, and to perform some pre-treatments of the spectra while new data are collected.

A time of flight system (with chopper) enables, for each detector, to select the elastically scattered neutrons, which correspond to static disorder. The analysis of the inelastic part of the time of flight spectra yields interesting information about localized excitations (crystal field, optical phonons ...).

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