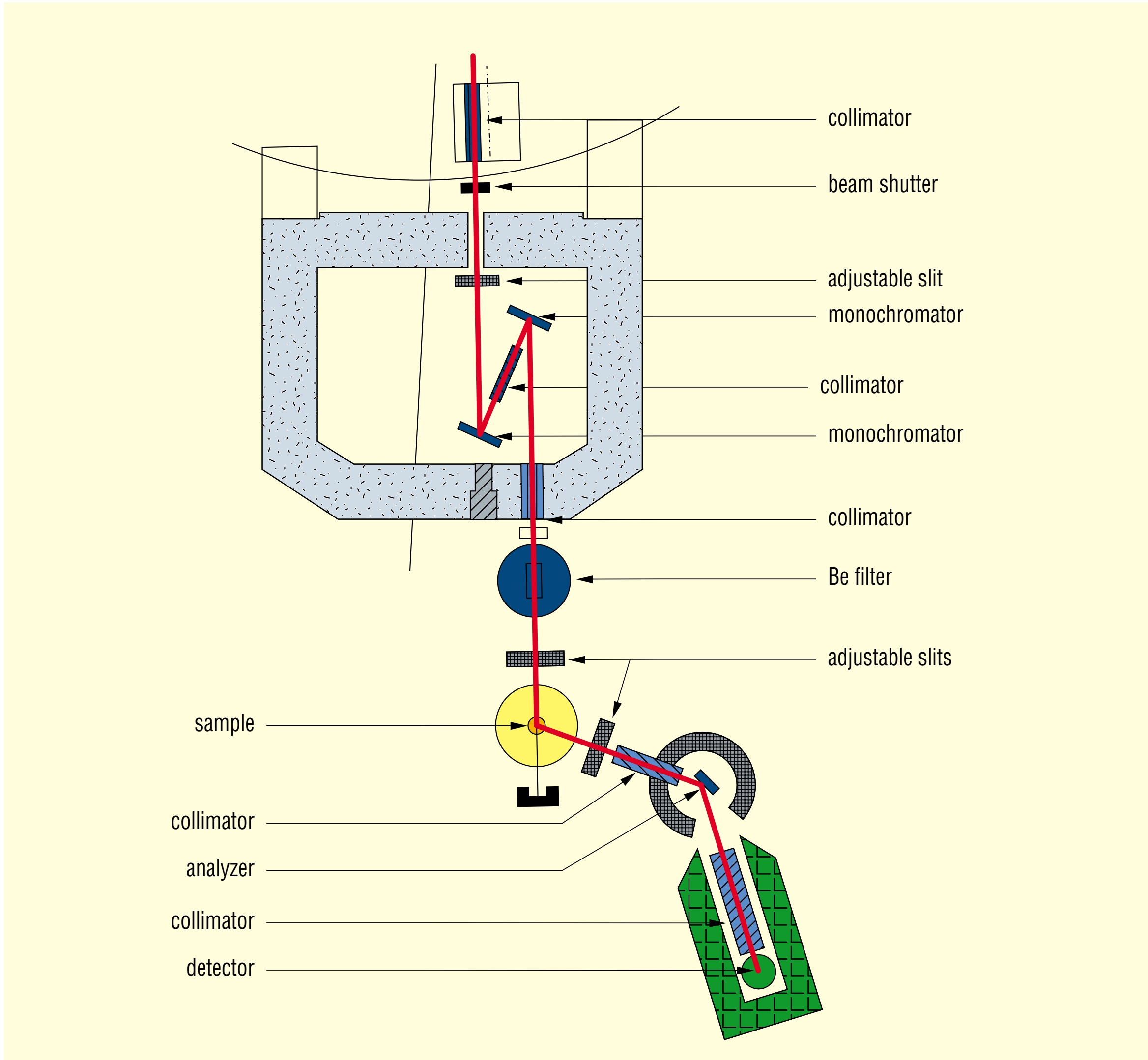
Areas are given...	Width x height
Beam tube...	Right beam of tangential channel 4 F aimed to cold source SF2
Monochromator...	Double monochromator set-up M1 : pyrolytic graphite h = 0.4° 11x8.5 cm² computer controlled vertical focussing M2 : pyrolytic graphite h = 0.4° 11x8.5 cm²
Analyzer..	Flat pyrolytic graphite h = 0.4 ° 7.5x5 cm² Horizontally curved pyrolytic graphite 6x6 cm² Flat Ge (111)
Collimations..	In pile : 50', 30', 15' between M1-M2 25' (optional) others : 60', 40', 20', 10'
Range of monochromator angle............................	$31° < 2\theta < 149°$
Range of scattering angle..	$-2° < \phi < 150°$
Range of analyzer angle..	$-150° < 2\theta_A < 150°$
Range of crystal orientation....................................	$0 < \psi < 350°$
Beam size at sample...	2 x 4 cm²
Detector...	^{3}He ∅ = 5 cm h = 15 cm
Incident wavelength (wave-vector)..........................	$2 < \lambda_i$ (Å) < 6.3 $(3.2 > k_i$ (Å^{-1}) $> 1)$
Scattered wavelength (wave-vector).......................	$1.6 < \lambda_f$ (Å) < 6 $(4 > k_f$ (Å^{-1}) $> 1.05)$

ki (Å^{-1})	1.05	1.55	2.66
Maximum energy creation (THz)	-	0.75 (3 meV)	3.1 (12 meV)
Best energy resolution (Ghz)	2.3 (9 µeV)	13 (50 µeV)	80 (320 µeV)
Typical energy resolution (Ghz)	7 (30µeV)	56 (220µeV)	300 (1,2 meV)
Maximum wave-vector transfer (Å^{-1})	1.9	3	5.1
Best wave-vector resolution (Å^{-1})	3.10^{-3}	$5\ 10^{-3}$	$.9\ 10^{-3}$
Flux at sample (n/cm2 sec.)	-	3.5×10^6	14×10^6

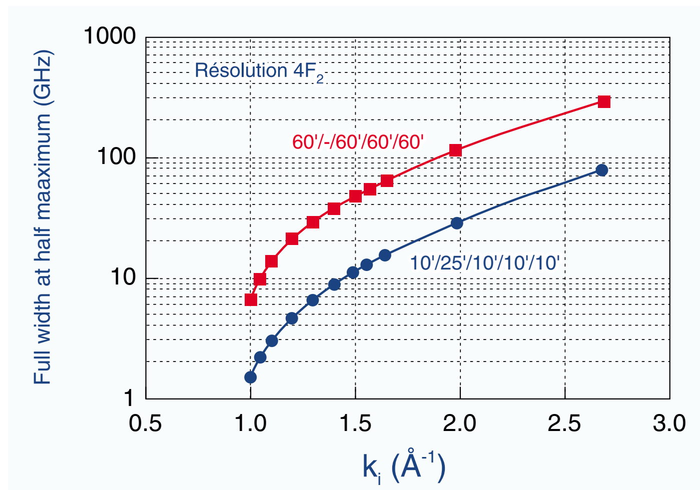
Ancillary equipment
- ★ Be filter (77 K)
- ★ "Triple Axis Equipment Pool" (see on front of this chapter)

4F1 and 4F2 are twin 3-axis spectrometers with very similar characteristics (see description below), which are fed by a liquid-hydrogen cold neutron source.
Polarized neutrons are only available on 4F1 (see 4F1 page).
These spectrometers are designed for measuring dispersive excitations with low energy transfers (w < 4 meV, n < 1THz) with a good resolution and a high flux (see Table).
They are well suited for measuring acoustic phonon dispersions, soft phonons, spin waves, quasi-elastic scattering, as well as for fine studies of modulated structures.
They are equipped with a double pyrolytic graphite monochromator, providing wavelengths between 6 and 2 Å (1.05 < ki < 2.7 Å^{-1}. Available collimators are (60’, 30’,15’) before and (60’, 40’, 20’, 10’) after the monochromators. An optional collimator (25’, 15’) can be added between the two monochromators. The monochromator has a computer-controlled vertical focusing.
The incident beam can be filtered by a cooled Be or a graphite filter.
The pyrolytic graphite analyzer is normally used in a horizontally focusing geometry. In this mode, the curvature of the analyzer is controlled by the computer, and the collimators (60’, 40’, 20’, 10’) are replaced by wedge-shaped tunnels.
The sample table is equipped with two orthogonal non-magnetic goniometers, allowing tilts of ± 20°. Their upper face (serving as a support for the various sample environments) is located 270 mm below the axis of the beam.
The sample-to-monochromator and sample-to-analyzer distances can be adjusted to accommodate various sample environments.
The spectrometer is controlled by a SUN computer running under Unix/Solaris OS. It allows various data processing softwares, including fit and convolution programs, to be run in real time during the measurements.



General layout of the diffractometer 4F2

Energy resolution (GHz) as a function of the incident wave-vector ki. Collimations are respectively: in-pile/M1-M2/M2-sample/sample-analyzer/analyzer-counter



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