Areas are given.....Width x height
Beam tube.....Left beam of tangential channel 4F,
aimed to cold source SF2
Radiant surface : 8 x 15 $cm^2$
Output of the channel : 4 x 7 $cm^2$
Monochromator.....Double monochromator set-up
M 1 : Pyrolytic graphite $\eta$ = 0.4° 11 x 8.5 $cm^2$
allows controlled vertical focussing
M2 : Pyrolytic graphite $\eta$ = 0.8° 11 x 8.5 $cm^2$

Analyzer..... Pyrolytic graphite $\eta$ = 0.4° 6 x 6 $cm^2$
Horizontally bent pyrolytic graphite 6 x 6 $cm^2$
Incident wavelength.....1.8 < $\lambda$ < 6 Å
Incident energy resolution..... 300 > $\delta E$ > 3 GHz
Collimation (horizontal)..... in pile : 50', 30', 15'
between monochrom.(optional) : 50'
others : 60', 40', 20', 10'
Range of monochromator angle (M2).....31° < $2\theta$ < 149°
Range of scattering angle.....-5° ≤ $\phi$ ≤ 140°
Range of analyzer angle.....0 < $2\theta_A$ ≤ 150°
Range of crystal orientation.....0 ≤ $\psi$ ≤ 360°
± 20° double goniometer
Detector..... $^3$He
Beam size at specimen..... 4 x 8 $cm^2$
Background.....~0.5 count/minute

| ki ($Å^{-1}$) | | 1.05 | 1.55 | 2.66 |
|---|---|---|---|---|
| Best energy resolution (FWHM at $\omega$ = 0) | (GHz) | 3.6 | 20 | 120 |
| | (microeV) | 15 | 80 | 500 |
| Best wave-vector resolution (FWHM) | ($Å^{-1}$) | $3.10^{-3}$ | $5.10^{-3}$ | $9.10^{-3}$ |
| Flux at sample ( n/cm2 sec) | | - | $3.5x10^6$ | $14x10^6$ |

Ancillary equipment

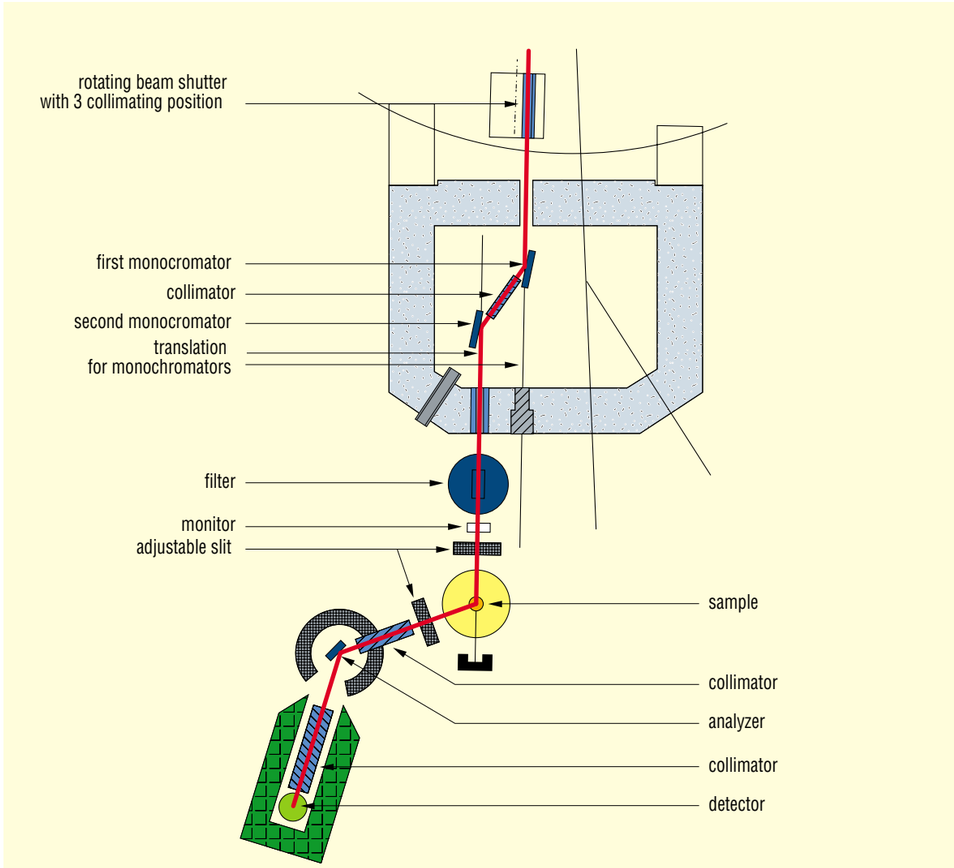
★ Be filter (77 K)
★ Neutron polarization and polarization analyzis
★ **"Triple Axis Equipment Pool"**
**(see on front of this chapter)**

4F1 and 4F2 are twin 3-axis spectrometers with very similar characteristics which are fed by a liquid-hydrogen cold neutron source
A full description of both spectrometers is given on the 4F2 page.
As an option, 4F1 can be equipped for polarized neutrons with polarization analysis.
The four intensities $I^{++}$, $I^{+-}$, $I^{-+}$, $I^{--}$ corresponding to neutron spin-flip and non–spin-flip processes can be measured sequentially.
This requires the installation of an additional shielded module between the monochromator and the sample, containing a filter, the polarizing supermirror and a Mezei flipper. The supermirror can be rotated to achieve optimal alignment, yielding a polarization efficiency of 98% with a reflectivity of 55% above $\lambda$ = 3.5 Å.

Vertical and horizontal guide fields are available.
The sample can be subjected to in a magnetic field:
• horizontal field up to 0.7 or 1.4 T (electromagnet), depending on the gap
• vertical field up to 0.14 T (Helmoltz coils) or 1.4 T (electromagnet) or 6T (cryomagnet)
• 3D-inclined guiding field of 1mT (cubic die magnet with 3 orthogonal windings).
The second flipper, made of a superconducting foil and a switched magnetic coil, is placed between the sample and the analyzer.
The horizontally curved Heusler analyzer performs both energy and polarization analyzis.








***General layout of the spectrometer 4F1***

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