Beam tube :	Tangential 40 x 80 mm^2
Monochromator :	PG 002, Cu 111, Cu 220
Incident wavelength :	0.6 < λ
Incident energy resolution :	Variable, typical 5 %
Analyzer :	PG 002
Collimations - In pile :	40' , 25' , 15'
Collimations - Mon-sample :	66' , 49' , 31' , 14'
Collimations - Sample-an.:	75', 49', 30', 23', 20', 12'
Collimations -An.-det. :	75', 49', 30', 23', 20', 12'
Range of monochromator take-off angle :	15° < $2\theta_m$ < 80°
Range of scattering angles :	-50° < φ < 125°
Range of detector angle :	-100° < 2θ < 100°
Range of goniometer arcs :	± 20°
Distance goniometer-center of beam :	170 ± 30 mm
Flux at specimen :	Strongly dependent on collimation and energy
Beam size at specimen :	Defined by diaphragm (30 x 40 mm^2)
Momentum transfer :	0.3 - 10 Å^{-1}
Energy transfer :	0.8 - 100 meV
Detector :	^{3}He (upright, area : 50 x 100 mm^2)

Ancillary equipment — ★ **"Triple Axis Equipment Pool" (see on front of this chapter)**

This triple-axis spectrometer is installed on the thermal neutron beamline and is dedicated to the study of inelastic neutron scattering due to collective excitations in condensed matter. The triple-axis geometry allows measurements of the scattering function S(**Q**, ω) in single crystals at well defined values of the reciprocal lattice vector **Q** and the energy, ω. In the past the spectrometer has been successfully utilized for investigations of lattice dynamics (phonons) and magnetic excitations (magnons and more exotic excitations in strongly correlated electron systems) in a wide variety of materials. The spectrometer has vertical and horizontal focusing of both the monochromator and analyzer, which optimizes the observed intensity at the expense of wavevector resolution. This feature allows one to obtain useful results even with relatively small samples.

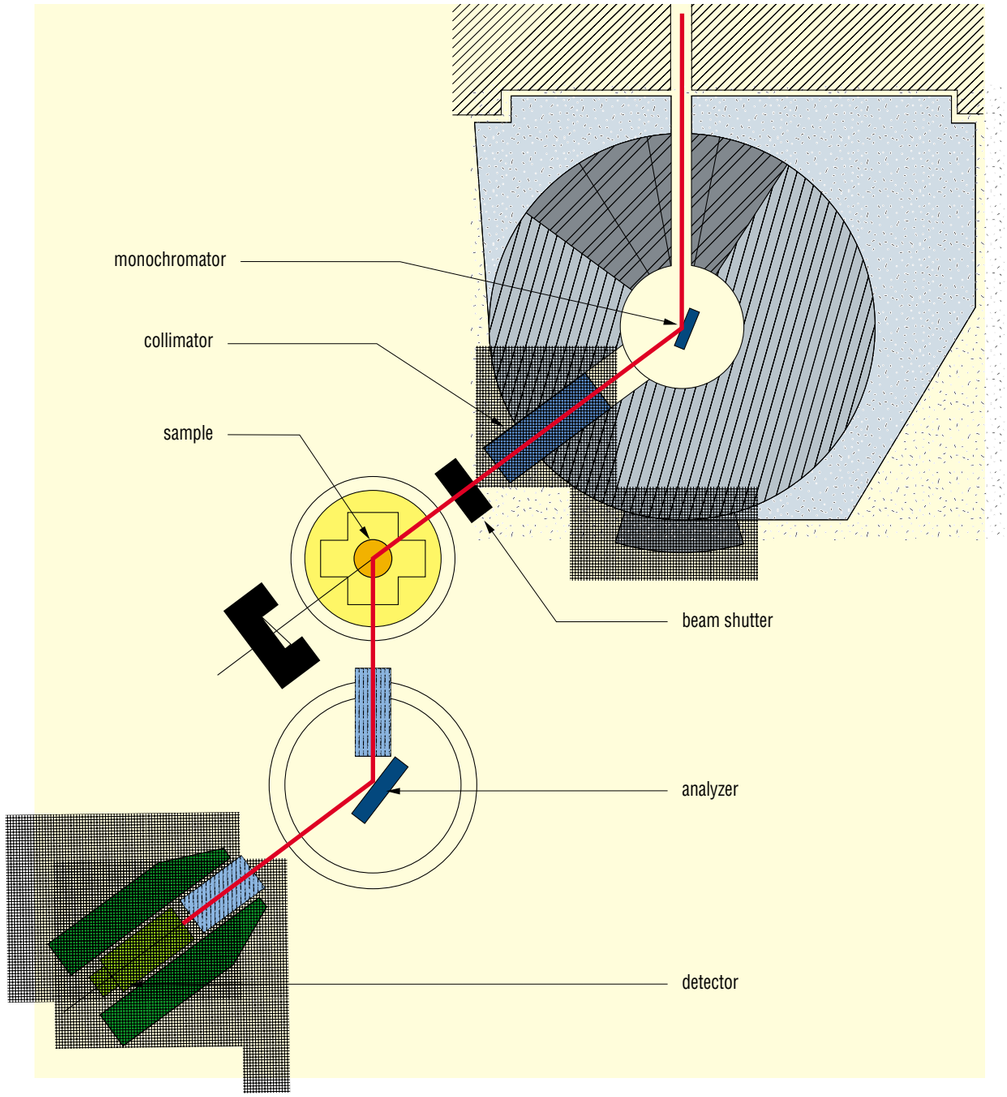
The main components of the instrument are the monochromator stage, the sample stage, and the analyzer stage. Neutron trajectories are defined by Soller collimators. Rutherford collimators with replaceable blades are available as well. The instrument is fully computer-controlled, with the software allowing scans in and out of the scattering plane.

The monochromator stage allows the use of three different monochromators (PG002, Cu111, and Cu220). All are vertically and horizontally focusing in order to increase the neutron flux at the sample position. The horizontal curvature for all monochromators, and the vertical curvature for the PG002 and Cu220 monochromators are fixed. The Cu111 monochromator has a variable vertical curvature, to achieve optimal focusing for a wide range of incident neutron energies. The monochromators, which are mounted inside a mobile concrete drum, can be interchanged by remote control.

The rotating sample stage is equipped with a double goniometer as well as translation stages, which allow one to tilt the sample in any direction as well as to adjust the horizontal and vertical positions of the sample.

The analyzer stage can be used with three different analyzers (flat PG002, focusing PG002). They are mounted on small individual modules that one can install in reproducible orientations. The focusing PG002 monochromator has fixed vertical curvature and variable horizontal curvature. It contains two remote-controlled slits, a vertical one before the analyzer crystal and a horizontal one before the detector. These can be used to optimize the signal to background ratio as well as the analyzer resolution.

Double Focusing Thermal Triple Axis Spectrometer 1 T1



General layout of the spectrometer 1 T1.

This spectrometer has been built by German scientists and is operated in collaboration between the INFP Karlsruhe and the L.L.B

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