



PA20 is a brand new small angle neutron scattering instrument designed for SANS/GISANS experiments requiring a good resolution and/or flux. It is equipped with an optional polarized beam and diaphragms in the collimator adapted for GISANS measurements as well. PA20 is installed at the end of the cold neutron guide G5 and was delivered and commissioned in 2015. The wavelength of the incoming neutrons are produced from a white beam by a mechanical velocity selector; wavelength may vary from 0.35 nm up to 2 nm. The neutrons are then collimated by a series of diaphragms and sections of moveable guides in an evacuated collimator of total length 16m. In non polarized mode, the double-V polarizer installed after the selector can be put aside thus reaching 18.5m of collimation in total. Six diaphragms along the collimator can be defined by the user according to its requirements (flux, resolution, beam size) as well as focusing lenses and an extensible nose at the end of the collimator. The sample holder is equipped with a double goniometer, height and translation motions of a rotating table that can host heavy equipment like furnaces, electromagnets (1.5T) and cryomagnets (up to 10T), linear temperature-controlled sample changers and shearing cell (Couette cell or Cone and Plate). The 3He multi-detector, with 128 x 128 cells of 5 x 5 mm², can be positioned at any distance between 1.2m and 19m from the sample in the longitudinal direction in its vacuum tube. While the vacuum tube cannot be moved, the 3He detector can be moved laterally to increase the available Q-range.

Type of instrument	Small angle neutron scattering for high resolution, large dynamical Q range and polarized neutrons
Beam tube	Neutron guide G51(cold source), super-mirror coating
Monochromator	Mechanical selector $3.5 \text{ \AA} < \lambda < 20 \text{ \AA}$ with $\Delta\lambda/\lambda=0.12$
Max flux at sample	strongly dependent on the chosen collimation
Max beam size at sample	typical size 1x1 cm ² but up to 2.5x2.5 cm ² if necessary
Moment transfer range	$10^{-4} \text{ \AA}^{-1} < Q < 1.0 \text{ \AA}^{-1}$
Distance sample detector	1.2 m to 19 m
Collimation	Rectangular and adjustable slits. Collimation lengths are 1.25 m, 3 m, 4.25m, 8 m, 11.75m, 15.5m, 18.5m (in polarized mode only). Focusing lenses and extensible nose.
Attenuators	Choice between 16 attenuators of different transmissions.
Detector	3He XY multidetector 64x64 cm ² , 5x5mm pixel size
Ancillary equipment	Automatic sample changer with temperature control Furnace (50-300 Celsius) Cryomagnets (1.5K, horizontal field 10T) Electromagnets with automated sample changer (1.5T) Couette type viscosimeter

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