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REFSANS: The horizontal time-of-flight reflectometer with GISANS option at the Heinz Maier-Leibnitz Zentrum

Friday 6 December 2024 13:45 (3 hours)

REFSANS is the horizontal TOF reflectometer at the MLZ, designed for reflectometry and GISANS studies of any interface, as well as to give simultaneous access to a range of Qz values.
Wavelength resolution may be tuned from 1.0 % up to 10%. The optics comprises neutron guide elements with different channels and special apertures to provide slit smeared or point focused beams for NR or GISANS measurements.
The investigation of kinetic processes is possible thanks to the possibility to embrace a Qz-range with a single instrumental setting. Time resolution can be pushed down to 30 s with data recorded in event-mode: this feature makes possible to perform various time re-binnings in order to tune the resolution/ intensity trade-off after the experiment.
Taking advantage of the long reactor shutdown, extensive simulations has been performed to find solutions that could increase the performance of the instrument and the flux at the sample position. It has been verified that with a modified design of the instrument geometry and with a new geometry of the radial collimators it would be possible to increase the flux on the sample up to a factor ~ 4 for NR and ~ 8 for GISANS measurements, for sample of typical sizes (50·80 mm^2). The new design makes also possible to investigate small interfaces (30·30 mm^2) with a gain factor of ~ 3 in intensity, opening new options for the experimental analysis of interfaces.

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