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

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REFSANS is the horizontal TOF reflectometer at the MLZ, designed to enable reflectometry and GISANS studies of any interface, as well as to give simultaneous access to a range of Qz values, which is especially useful to study air-liquid interfaces or kinetic phenomena.
Wavelength resolution may be tuned from 0.2 % up to 10%. The optics comprises neutron guide elements with different channels and special apertures to provide, on the one hand, slit smeared beams for conventional reflectometry and, on the other hand, point focused beams for GISANS measurements. Furthermore, it is possible to independently control the horizontal and vertical beam divergence, in dependence on the sample characteristics.
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. Beside the typical sample environment, the realization of an electrochemical compact cell and the design of a humidity cell are in progress, in order to allow the investigations of electrode processes and of processes in a controlled atmosphere. Furthermore, simulations to realize a flexible focusing optical system are in progress, capable of offering unique possibilities for the investigations of small samples ($\leq 20 \cdot 20$ mm^2).

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