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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 in Garching. It is designed to carry out specular and off-specular reflectivity, as well as GISANS studies of solid/liquid, solid/air and liquid/air interfaces. Through ToF analysis, REFSANS gives simultaneous access to a range of Q values (with Qmax/Qmin up to ≈ 7), useful to study air-liquid interfaces and kinetic phenomena.
A chopper-system composed by six disks allows a tunable wavelength resolution, from 0.2 % up to 10%. The neutron optics of REFSANS 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.
Given the ToF nature of REFSANS, the investigation of kinetic processes is based on the possibility to embrace a Q-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 after the experiment. Beside the typical sample environment, a three-electrode electrochemical compact cell was recently realized for investigation of phenomena at the electrode surface. Currently, the design of a humidity cell is in progress, to allow investigations of processes in a controlled atmosphere.

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