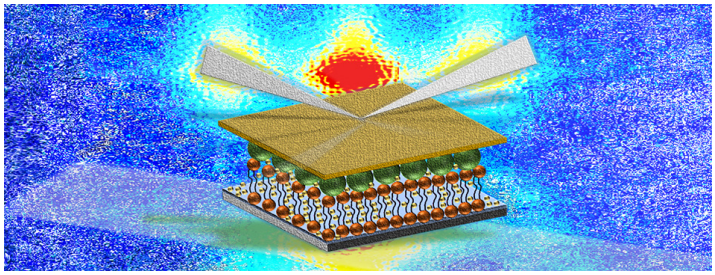

Beitrag ID: **10** Typ: **Poster**

Neutron tools for detecting nano-second dynamics at interfaces

Mittwoch, 9. Oktober 2024 16:59 (7 Minuten)

Over the past three to four decades, the technique of grazing incidence small-angle scattering has gained widespread acceptance as a means to investigate nanostructures near the surface. While conventional X-ray methods involve directing the beam onto the sample from a vacuum, typically on a wafer, neutron-based approaches allow the beam to penetrate through a silicon wafer, thereby accessing buried near-surface structures. This capability facilitates the study of solid-liquid interfaces, crucial in fields like battery research, colloid science, and physics of complex fluid.

A recent advancement in grazing incidence neutron scattering involves the utilization of neutron spin echo (NSE) spectroscopy. This technique enables detailed examinations of the dynamics of microemulsions and lipid bilayers. By utilizing adjacent planar solid interfaces to confine the membranes of complex fluids, NSE reveals novel physics and mechanisms, unveiling unforeseen phenomena. Several examples showcasing specific unexpected features are presented.

Technically, our development includes a resonator designed to enhance the wave field within the fluid. This enhancement significantly boosts scattering intensities by allowing much higher intensities to pass through the sample. Additionally, at the SNS spallation source in Oak Ridge, a neutron prism is incorporated into the NSE setup to adjust for wavelength-dependent critical angles. This prism ensures a consistent and suitable depth resolution throughout the experiment.

Hauptautor: FRIELINGHAUS, Henrich (Jülich Centre for Neutron Science at MLZ, Forschungszentrum Jülich GmbH, Garching, Germany)

Co-Autoren: HOLDERER, Olaf (JCNS); Dr. ZOLNIERCZUK, Piotr (ORNL); JAKSCH, Sebastian (European Spallation Source ERIC)

Vortragende(r): FRIELINGHAUS, Henrich (Jülich Centre for Neutron Science at MLZ, Forschungszentrum Jülich GmbH, Garching, Germany)

Sitzung Einordnung: Poster

Track Klassifizierung: Bio-interfaces