



"Soft-Matter Seminar"

Soft Matter in Confinement: High-Energy and Resonant Soft X-Ray Reflectivity Studies

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Abstract:

Interfacial phenomena in physical, chemical, and biological systems are at the core of many of today's technological applications. High-energy and resonant soft x-ray reflectivity are complementary techniques that can provide information on surfaces and buried structures, scarcely accessible by most conventional experimental methods.

Our experiments include studies on hydrophobic solid-water interfaces functionalized with hydrocarbons and perfluorinated alkyl chains. The experimental data provide clear evidence for an interfacial density depletion with an integrated deficit corresponding to less than a water monolayer. The extent of this gap is governed by a complex interplay between surface chemistry and topography.

In another example, I will discuss the interfacial structure of ionic liquids on sapphire. From high energy x-ray reflectivity data we extracted an oscillatory profile comprised of alternating anion and cation enriched layers. NEXAFS spectroscopy and soft x-ray reflectivity measurements demonstrate the high sensitivity of resonant scattering techniques to the molecular order induced by the free surface.

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