GRACING INCIDENCE SCATTERING

Max Wolff

Division for Materials Physics, Uppsala University, Sweden

e-mail: max.wolff@physics.uu.se

Grazing incident scattering techniques are a powerful tool to investigate surfaces and interfaces. In addition to the density profile along the surface normal probed in conventional reflectivity experiments and correlations in the plane of the interface on length scales of micrometers, as probed by diffuse scattering, gracing incident small angle scattering and diffraction probes in-plane structures on the nanometer length scale.

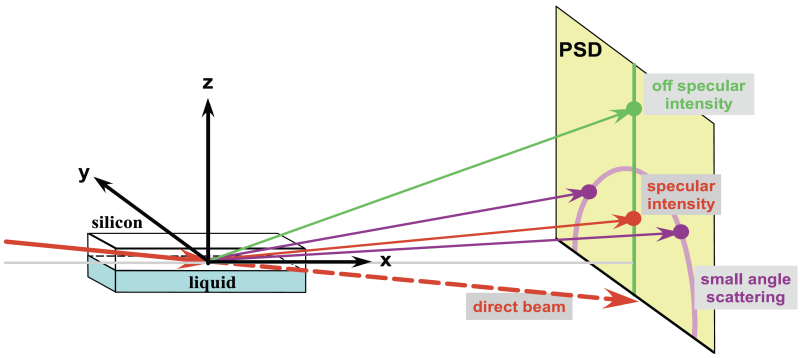

Fig. 1. Schematic of the geometry for grazing incidence scattering. The beam impinges on a sample under a shallow angle, close to the angle of total external reflection. The scattered intensity is registered by a position sensitive detector [1].

In this talk the scattering geometry (Figure 1) and peculiarities (Figure 2) of experiments conducted under gracing incident beam geometry will be discussed and basic theoretical concepts to describe them will be introduced. The use of the technique will be exemplified with several examples, from neutron as well as x-ray scattering, that have recently been published.

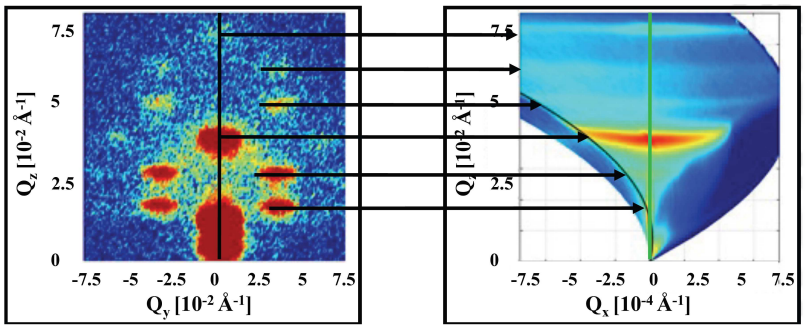

Fig. 2: Scattering patterns as obtained in gracing incident geometry. The left panel and the right panel depict the small angle scattering and reflectivity, including diffuse scattering, respectively, for a micellar polymer system forming a fcc packing at the solid liquid interface [1].

References

[1] M. Wolff et al., Euro. Phys. J. E 16, 141 (2005)