OFF-SPECULAR NEUTRON AND X-RAY REFLECTOMETRY

Philipp Gutfreund

Institut Laue-Langevin, Grenoble, France

e-mail: gutfreund@ill.eu

First, I will give an introduction into the theoretical basics and the experimental challenges of Small Angle Scattering under Grazing Incidence and will focus this lecture on Diffuse Reflectometry.[1] I will introduce common approximations in surface scattering, namely the Born Approximation and the Distorted Wave Born Approximation and explain the limits of applicability. Every section will be supported by actual scientific problems and recent results as shown in the Figure 1 in order to introduce common data analysis procedures to the students.

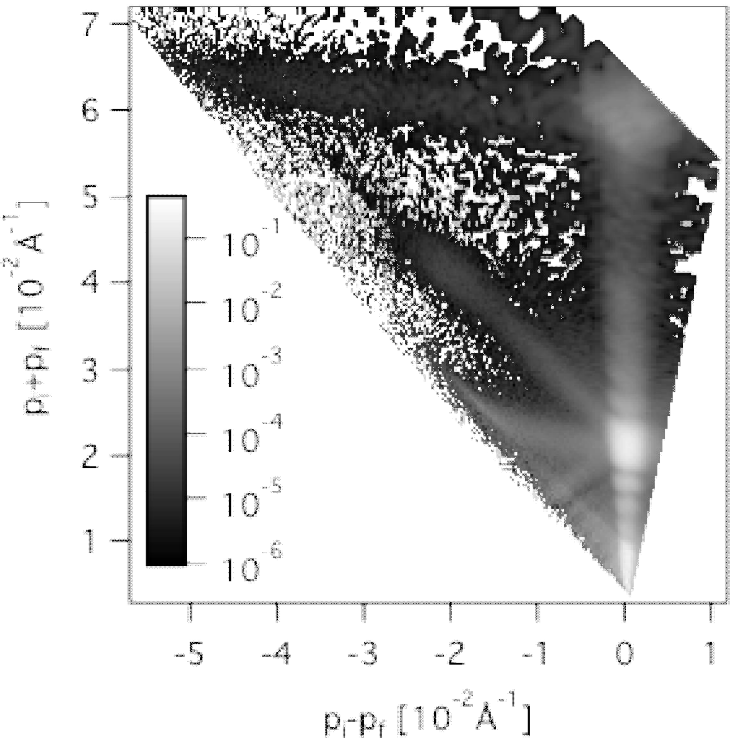

Fig. 1: Off-specular map of a polymer multilayer recorded on D17.

Basic knowledge of neutron and X-ray scattering theory as well as specular reflectivity is recommended for this lecture.

References

[1] M. Tolan, X-Ray Scattering from Soft Matter Thin Films, - Materials Science & Basic Research -, STMP. Springer (1998), H. Zabel, K. Theis-Bröhl, B.P. Toperverg, Handbook of Magnetism and Advanced Magnetic Materials. pp.1237 John Wiley & Sons (2007), J. Daillant, A. Gibauld eds. X-Ray and Neutron Reflectivity – Principles and Applications. Vol 770 Springer (2009)