Models for diffuse x-ray scattering from multilayer structures

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X-ray scattering measurements from multilayers contain a wealth of information on the nature of the roughness of the interfaces. Whereas from specular reflectivity the root-mean-square roughness can be found, non-specular (diffuse) scattering yields information on the lateral correlation and the conformality of the rough interfaces.

The theoretical base for the interpretation of these measurements will be reviewed [1]. Several models are available, which are valid for different regimes of experimental circumstances and material parameters. The applicablity of these models will be discussed and hints for a fitting strategy will be given.

[1] D.K.G. de Boer, Phys. Rev. B 53 (1996) 6048