

## **DIFFUSE X-RAY REFLECTION FROM RANDOMLY ROUGH MULTILAYERS - BEYOND THE STANDARD FRACTAL MODEL**

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Specular and diffuse x-ray reflection from rough surfaces and interfaces are usually analyzed assuming a self-affine fractal model of random roughness. In many cases, this model yields a reasonably good correspondence of the measured and simulated data; however it cannot be correct in a strict sense. The lower critical dimension beyond which the model fails (lower cutoff) is represented by inter-atomic distance, the upper cutoff, usually called roughness correlation length, is the maximum distance at which the scaling law is valid. In the talk I will present several non-fractal models of rough multilayers (terraces, ripples, nanowires, quantum dots) and discuss their range of validity.

The correlation of the roughness profiles of different interfaces in a multilayer is usually described by a vertical correlation length; this model sometimes fails, since the degree of correlation could depend on the space frequency of the roughness component. In the talk I will deal with other approaches, based on numerical Monte-Carlo simulations.

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