X-ray reflectivity studies of thin films

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X-ray reflectivity is a standard method to determine thin film thicknesses [1-2]. In addition, it is sensitive to the thin film's surface and interface roughness. We propose to study the impact of various X-ray optics on the X-ray reflectivity signal and the potential change of the deduced quantities like film thickness and roughnesses. The determined surface roughness shall be compared to the one obtained using atomic force microscopy.

An interested student would perform the X-ray reflectivity measurements, compare, and analyze the results using well established models. This project will be performed within the framework of Laboratory of OptoSpintronics, which is a joint laboratory of MFF UK a FZU AV ČR.

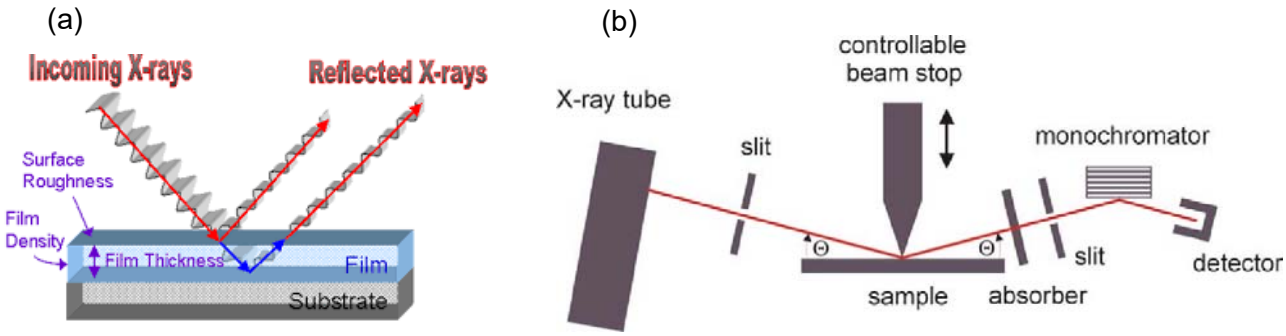

Fig. 1 : (a) Schematic picture of X-ray reflectivity measurement (b) Experimental setup for X-ray reflectivity

[1] https://psec.uchicago.edu/blogs/photocathode_development/wp-content/uploads/2013/03/Introduction-of-X-ray-Reflectivity11.pdf

[2] https://www.eng.uc.edu/~beaucag/Classes/Characterization/ReflectivityLab/NorthEastern University Basic Principles of X-ray Reflectivity in Thin Films - Felix Jimenez-Villacorta.pdf