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Organic and inorganic layered systems study by X-ray standing wave technique

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The grazing incidence x-ray standing wave technique (XSW) is widely used for thin layered structure investigation. It is based on simultaneous analysis of x-ray reflectivity and x-ray fluorescence yield modulated by standing wave field formed due to the interference of the incident and reflected beams. While the reflectivity is sensitive to general distribution of electron density the angular dependence of fluorescence yield is sensitive to the position of selected atom along the normal to the surface [1, 2].

In this report the XSW technique was used for the determine of the preferential molecular orientation in organic monolayers of porphyrin(Zn)-fullerene dyad ZnDHD6ee on the water surface and solid substrate [3], for the investigation of diffusion process in thin layered structures during the thermal quasicrystal film formation [4] and of the growth mechanisms in the Si-Ge heterostructures [5]. It is well-known that XSW is very promising to study of the planar systems different nature – organic, bioorganic and inorganic, including self-organizing macromolecule or lipid-protein systems on water surface [1]. This technique also can be used for “in vitro” study of transport, barrier and protective functions of cell-membrane model.

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Primary author: Dr TERESCHENKO, Elena (NRC Kurchatov Institute, Institute of Crystallography RAS)

Co-authors: Dr SEREGIN, Alexey (NRC "Kurchatov Institute", Institute of Crystallography RAS); Prof. KOVALCHUK, Mikhail (NRC Kurchatov Institute, Institute of Crystallography RAS); Dr YAKUNIN, Sergey (NRC Kurchatov Institute)

Presenter: Dr TERESCHENKO, Elena (NRC Kurchatov Institute, Institute of Crystallography RAS)

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