Detection of weak X-ray Waves Scattered by the Crystal Subsurface Inclusions

Hakob P. Bezirganyan[a], Hayk H. Bezirganyan (Jr.)[b], Siranush E. Bezirganyan[c], Petros H. Bezirganyan (Jr.)[d], *[a]Department of Solid State Physics, Faculty of Physics, Yerevan State University, Yerevan, Armenia. [b]Faculty of Computer Science and Applied Mathematics, Yerevan State University, Yerevan, Armenia. [c]Department of Medical & Biological Physics, Yerevan State Medical University after Mkhitar Heratsi, Yerevan, Armenia. [d]Department of Computer Science, State Engineering University of Armenia, Yerevan, Armenia*. E-mail: hakob_bezirganyan@yahoo.co.uk

In presented theoretical paper a method is proposed appropriate for the non-destructive high-resolution investigations of the various kinds of non-diffracting subsurface nanosize inclusions based on the Grazing-Angle Incidence X-ray Backdiffraction (GIXB) technique [1, 2], which takes place in the conditions of specular vacuum wave suppression phenomenon [3]. Note that in the conditions of the reflected wave suppression mode [3] the specular wave (contrary to other existing X-ray diffraction methods) practically carries the information only about the non-diffracting subsurface inclusions.

Proposed method can be used to register relatively weak X-ray waves scattered by the non-diffracting subsurface inclusions or reflected by the surface regions, which aren't involved in backscatter diffraction process inside the thin crystalline film or the nanostructure.

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Keywords: inclusions in crystal, grazing incidence x-ray diffraction, x-ray backscatter diffraction