X-Ray Diffuse Scattering on the First Type Defects in Semiconductors

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X-ray diffraction techniques give powerful tool for the investigation of the defect structure in crystals. For the case of I type defects (as interstitials, vacancies, dislocation loops etc.) in the lattice, main of these methods [1,2] are based on the analysis of the Huang and Stoks-Wilson scattered ranges, which contain information about the distortion field around the defect.

From our observations we conclude that described experimental procedures for determination of defects size and their concentration are trustworthy at the special case and can not be used for general one.

In this work we analyzed more basic case of the defect structure which include the simultaneously presence of defects giving lattice deformation of opposite signs. The effects following from the assumption that defect concentration should be described as a function of defects size are considered in details.

All diffraction measurements presented in this work were made using the triple-axes diffractometer Philips X'Pert MRD.

[1] Larson B.C., Schmatz W., *Phys. Rev. B.,* 1974, **10(6)**, 2307. [2] Patel J.R., *J. Appl. Cryst.,* **8**, 186.

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