UZ9700705

ULTRASOUND INVESTIGATION OF INHOMOGENEOUS IN IRRADIATED SILICON

Kalanov M.U., Paizullakhanov M.S., Haidarov T., Ummatov H.D., Abdurakhmanova S.N.
Institute of Nuclear Physics, Uzbekistan Academy of Sciences

Submicroscopic inhomogeneous in single and polycrystalline silicon samples as well as their behavior after X-ray irradiation were investigated by means ultrasound resonance.

The samples shape a disk 4 mm in thickness and 27,5 mm in diameter with cut plane parallel to crystallographical plane (111) were irradiated by 1 Vt/cm^2 power X-ray(50 keV, Mo K_α) during 10 hours. The samples relative orientation dependence of inner friction i.e. $Q^{-1}=f(\varphi)$ is discovered double humps shape in the case of single crystalline silicon with a maximum at a value of $\varphi=90^o$ and 270°. The analysis showed that such a shape of the $Q^{-1}(\varphi)$ caused by availability of planar submicroscopic inhomogeneous in silicon. The initial resonance frequency not changed by sample location if axis of the defect is parallel to active element of the apparatus. The normal co-location of the defect axis and active element of the apparatus lead to maximal change of the resonance frequency. The such a co-location twice repeated at full turning of the sample, that was observed. The dependence shape not changed after X-ray irradiation, and width of the humps increases. These results sowed, that the shape and orientation of the inhomogeneous not changed after X-ray irradiation, but their concentration more increases.

The double humps shape of dependence $Q^{-1}(\varphi)$ not discovered in the case of the policrystalline silicon. This caused by abundance of the blocs and greens, but their orientation in the materials volume is quite isotropic.