INCOHERENT-LIGHT PULSE ANNEALING OF NANOPOROUS GERMANIUM LAYERS FORMED BY ION IMPLANTATION

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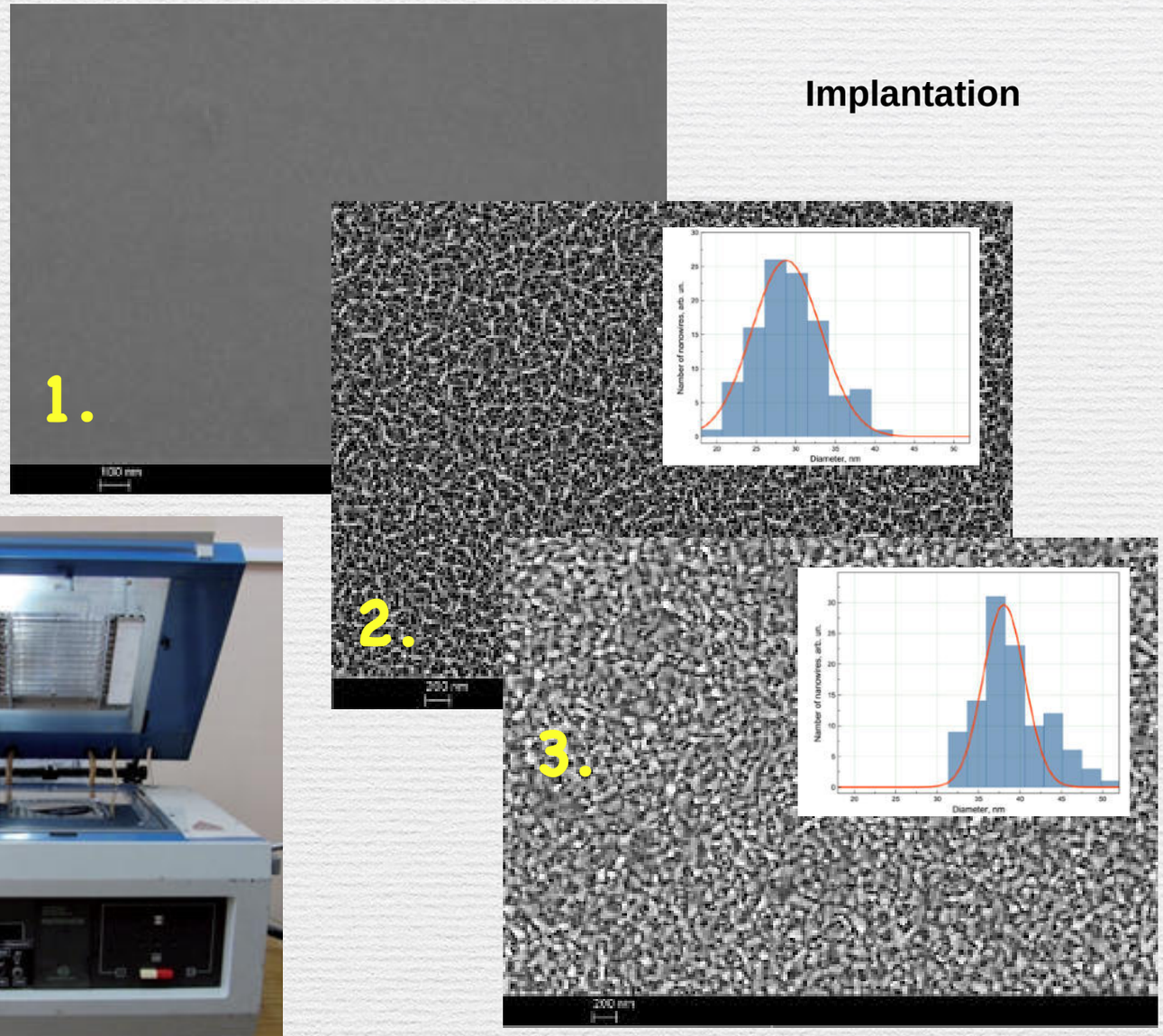
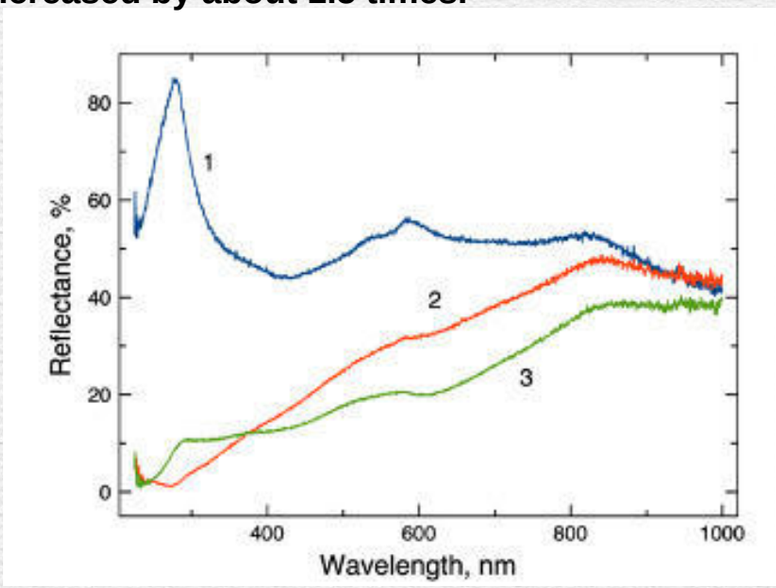
The study addresses the monocrystalline c-Ge substrates implanted by Ag^+ ions with the energy of 30 keV, irradiation dose of 7.5×10^{16} ion/cm^2 and annealed by incoherent-light pulse. By scanningelectron microscopy and optical spectroscopy measurements it was shown that after ion implantation anamorphous porous Ag:PGe layer of a spongy structure with nanowires on the c-Ge substrate wereformed. The spongy pulse light annealed structure of the Ag:PGe layer was not destroyed, however the diameters of nanowires increased by about 1.5 times.



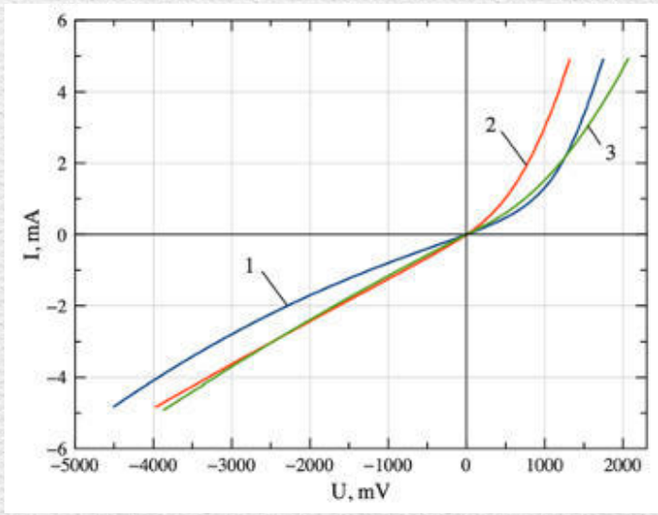
Implantation



Optical reflection spectra from samples: (1), (2), (3)

Special "Impuls-6" equipment for ILP annealing

SEM-images of surfaces (1) c-Ge, (2) c-Ge implanted by Ag^+ ions at E=30 keV, J=8 μA/cm^2, D=$7.5\cdot10^{16}$ ion/cm^2 and (3) same implanted sample treated by ILP annealing



I–V characteristics for various samples: (1) c-Ge, (2) c-Ge implanted by Ag^+ ions at E=30 keV,J=8 μA/cm^2 , D=$7.5\cdot10^{16}$ ion/cm^2 and (3) same implanted sample treated by ILP annealing

References:
1. A.L.Stepanov, B.F.Farrakhov, Ya.V.Fattakhov, A.M. Rogov, D.A. Konovalov, V.I. Nuzhdin, V,F, Valeev, Incoherent-light pulse annealing of nanoporous germanium layers formed by ionimplantation, Vacuum, 186 (2021) 110060. DOI:10.1016/j.vacuum.2021.110060.