PLANAR GETTERING OF METAL IMPURITIES IN MBE GROWN Si AND SiGe LAYERS ON Si SUBSTRATES

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We investigated implantation-induced low-temperature planar gettering in Si/Si and SiGe/Si epitaxial structures grown by means of Molecular Beam Epitaxy (MBE) on float-zone (FZ) and Czochralski-grown (Cz) Si substrates. Generation lifetime improvements of about two orders of magnitude, induced by planar gettering, were measured in heavily contaminated wafers applying laterally resolved capacitance-voltage (CV) techniques in Metal Oxide Insulator (MOS) structures. Planar gettering in FZ-Si wafers was induced by 50 keV C^+ implantation with doses higher than $3 \cdot 10^{15}\,cm^{-2}$. The generation lifetime was improved within one to two mm from the gettering areas. Additionally, bulk gettering in the implanted areas in FZ-Si wafers after oxidation was demonstrated using Time Resolved Microwave Conductivity (TRMC) measurements. In Cz-Si wafers, no significant planar gettering effects could be observed. This is, probably, due to the influence of oxygen, which passivates the gettering centers generated by C^+ implantation.