Contribution ID: **6** Type: **not specified**

Fluence and isochronal anneal dependent variations of recombination and DLTS characteristics in neutron and proton irradiated MCz , FZ and epi-Si structures

Monday 2 June 2008 11:10 (20 minutes)

A comparative analysis of the recombination, generation and reverse recovery lifetime dependent on stopped protons fluence and isochronal anneal temperature is presented for FZ Si structures. In DLTS, heat treatments indicate transformations of majority and minority carrier traps. These changes are also revealed by variations of the excess carrier decay lifetime. The main transformations can be attributed to hydrogen implantation related defects (VOH etc). Also, a comparative study of the impact of penetrative neutrons and protons on recombination and DLTS characteristics in MCz, FZ and epi-Si structures has been carried out. A nearly linear decrease of the recombination lifetime with fluence of the reactor neutrons from 1012 to 3×1016 n/cm2 in the MCz grown Si samples corroborates a non-linear introduction rate of dominant recombination centers. An increase of lifetime and a change of carrier decay shape (process) in reactor neutrons irradiated MCZ Si, dependent on fluence, appears under annealing at elevated temperatures (>180 C, for 24 h). Lifetime behavior with heat treatment temperature shows an enhancement of competition between recombination and trapping centers which is the most pronounced for moderate fluences irradiated material.

Author: Prof. VAITKUS, Juozas (Inst. of Mater. Sci. & Appl. Res. (IMSAR) - Vilnius University)

Co-authors: Mr ULECKAS, Aurimas (Vilnius University, Institute of Materials Science and Applied Research); Dr GAUBAS, Eugenijus (Vilnius University, Institute of Materials Science and Applied Research); Prof. RAISANEN, Jyrki (University of Helsinki); Mr CEPONIS, Tomas (Vilnius University, Institute of Materials Science and Applied Research)

Presenter: Prof. VAITKUS, Juozas (Inst. of Mater. Sci. & Appl. Res. (IMSAR) - Vilnius University)

Session Classification: Defect and Material Characterization