



Contribution ID: 45

Type: Oral Presentation

Germanium-Carbide Formation on Crystal Germanium Substrate

Thursday, 14 July 2011 14:15 (15 minutes)

Microcrystalline germanium-carbide formation was studied in germanium substrate using perturbed gamma-gamma angular correlation (PAC) method. Information about the lattice location of carbon atoms, in the host matrix, can be obtained via the interaction between carbon and unstable probe nucleus (^{111}In). At high dose carbon implantation, in crystal germanium substrate, two defect complexes have been identified by the corresponding unique nuclear quadrupole interaction frequencies. The measured frequencies, $\nu_Q = 207(1)$ MHz ($\eta = 0.2$) and $\nu_Q = 500(1)$ MHz ($\eta = 0$), are associated with the formation of carbon related microcrystalline system in germanium. The frequencies are attributed to two different types of carbon-indium pairs in the substrate lattice. The orientations of the measured electric field gradients and thermal stability of the defect complexes are studied. The results are encouraging towards attaining germanium carbide crystal which has interesting potential for applications.

**Level (Hons, MSc,
 PhD, other)?**

PhD

**Consider for a student
 award (Yes / No)?**

No

**Would you like to
 submit a short paper
 for the Conference
 Proceedings (Yes / No)?**

yes

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Session Classification: CMPMS1

Track Classification: Track A - Condensed Matter Physics and Material Science