

## Towards the Modeling of Impurity-Related Defects in Irradiated *n*-Type Germanium: a Challenge to Theory

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Electrical measurements on heavily doped *n*-type germanium subjected to gamma-irradiation show that the features of impurity-related defect formation before  $n \rightarrow p$  conversion of conductivity type are the same as those previously observed in lightly and moderately doped materials, thus extending the range of doping from  $\approx 10^{14}$  to  $\approx 10^{16} \text{ cm}^{-3}$ . It is clear now that the presently adopted model of the dominant impurity-related defects as simple vacancy-impurity pairs in irradiated *n*-Ge, in analogy to such defects reliably identified in irradiated *n*-Si, appears to be inconsistent with the experimental information collected so far. As a consequence, the impurity diffusion simulations in heavily doped Ge based on this model need to be reconsidered. The requirements to be met while modeling impurity-related defects in irradiated *n*-Ge in accordance with the reliable experimental data are established.

**Keywords:** germanium, irradiation, impurity-related defects.

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