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Defect levels induced by defect-complexes in Ge for enhanced Ge-based device performance

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Defect complexes have a significant impact on the structural, electronic, optical and electrical properties of semiconductors. Several defect complexes formed by n-type and p-type atoms in Ge have been implemented for the development of improved modern microelectronic devices. However, there is no reported study on the substitutional-interstitial defect complexes formed by trivalent atoms in Ge. This study presents a hybrid density functional theory study of the structural, electronic, formation and defect levels induced by defect complexes in Ge. A crucial understanding of the electrically active defect levels induced by defect complexes in Ge, which could be courted for application in improved Germanium-based microelectronic devices is provided.

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