

Abstract Submitted
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Long-range-order and Short-range-order Structures in Sn-doped Ge Thin Films¹ YUN-LIANG SOO, S.L. CHANG, National Tsing Hua University, J.F. LEE, National Synchrotron Radiation Research Center, H.H. CHENG, National Taiwan University — The Sn-doped Ge semiconductor thin films have shown direct bandgap and many other interesting physical properties with great potential for technological applications. To understand the underlying mechanism for the unique properties of these materials, information on the locations of Sn atoms in the matrix and the effects of Sn doping on the crystal structure of Ge host is an important prerequisite. Samples of Sn-doped Ge thin films of thickness around 300Å and Sn concentration 4 at.% to 28 at.% have been prepared by molecular beam epitaxy (MBE) method. Long-range-order and short-range-order structures in these films have been probed by using x-ray diffraction (XRD) and extended x-ray absorption fine structure (EXAFS) techniques, respectively. Our x-ray results demonstrate that Sn impurity atoms are located on the substitutional sites in the Ge films with Sn concentration up to 20 at.%. Variation of lattice constant as a result of Sn doping in the Ge host will also be presented.

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Yun-Liang Soo
National Tsing Hua University

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