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**Spontaneous Emission of GeSn via Thin Film Alloys and Quantum Wells**[1] ELAHEH GHANATI, Department of Electro-Optics and Photonics, University of Dayton, JAY MATHEWS, Department of Physics, University of Dayton — The microelectronics industry is based on silicon. Si has mechanically rigid crystalline structure and has reasonable electrical characteristics, however its optical properties do not make it the best choice for photonics. The band gap does not allow for absorption in the 1.2-2 um range and the indirect band gap means that no lasers can be produced from silicon.silicon compatible material which responds actively and efficiently to light, with the ability to emit or receive in the infrared region, could be used to achieve infrared photonic devices on silicon. Ge is a promising candidate due to its lower band gap and its ability for direct band gap emission. It has been reported that alloying Ge with Sn helps to change the band structure of Ge by lowering the band gap, and increasing the efficiency of optical absorption and emission. In this work, we explore the tunability of optical emission by measuring photoluminescence from GeSn thin films with varying concentrations of Sn and comparing experimental data with the theoretical data (generic perturbation model).

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