Abstract Submitted
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Theoretical Modeling of GeSn Waveguide Emission[1] ZAIRUI LI, IMAD AGHA, Department of Electro-Optics and Photonics, University of Dayton, Dayton, OH 45469, USA, JAY MATHEWS, Department of Physics, University of Dayton, Dayton, OH 45469, USA — Laser devices operating in the short to mid infrared region are typically made from direct band gap III-V materials, which are not compatible with Si electronics. Thus, finding Si-compatible photonic materials to provide for integrated lasers has become a major area of research. Developing a COMS compatible on-Si NIR laser that can operate at room temperature (RT) is a critical component for integrated photonics. The optical properties GeSn alloys and their the growth of GeSn on Si makes this alloys a candidate for photonic devices. Many research have success on making such lasing devices with There have been several successful demonstrations of lasing in waveguides fabricated from GeSn, however no RT lasing has been demonstrated. Developing new optical gain materials into lasing devices are ideally begin with a well understanding of the material properties. In practice, the orientation of fabrication, experiments and modeling towards making new laser device may not be trivial. Since Ge and GeSn are not as well studied as other well-known lasing materials, the lack of understanding might be the roadblock of getting RT lasing. In this presentation, a modeling of GeSn optical properties and GeSn waveguides simulation compel with our experiment and other successful research result will be discussed. The modeling outcome provides help for further research.

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