Abstract Submitted
for the OSS16 Meeting of
The American Physical Society

Room temperature lasing in GeSn alloys: A path to CMOS-compatible infrared lasers ZAIRUI LI, YUN ZHAO, Electro-Optics Program, University of Dayton, Dayton, OH 45469, JAMES GALLAGHER, Department of Physics, Arizona State University, Tempe, AZ , IMAD AGHA, Electro-Optics Program, University of Dayton, Dayton, OH 45469, JOS MENNDEZ, Department of Physics, Arizona State University, Tempe, AZ, JOHN KOUVETAKIS, Department of Chemistry and Biochemistry, Arizona State University, Tempe, AZ, JAY MATHEWS, Electro-Optics Program, University of Dayton, Dayton, OH 45469 —
The semiconductor industry has been pushing silicon photonics development for many years, resulting in the realization of many CMOS-compatible optoelectronic devices. However, one challenge that has not been overcome is the development of Si-based lasers. Recently, GeSn alloys grown on Si have shown much promise in the field of infrared optoelectronics. These alloy films are compatible with CMOS processing, have band gaps in the infrared, and the band structure of GeSn can be tuned via Sn concentration to induce direct band gap emission. In this work, we report on room temperature emission in optically-pumped waveguides fabricated from Ge0.956Sn0.044 and Ge0.928Sn0.072 films grown epitaxially on Si(100) substrates. The waveguides were defined using standard UV photolithography and dry-etched in a Cl plasma. The end facets were mirror polished, and Al was deposited on one facet to enhance cavity quality. The waveguides were optically-pumped using a 976nm wavelength solid-state laser, and the corresponding emission was measured. The dependence of the emission power on the pump power shows the simulated emission is highly amplified and with higher Sn concentration sample shows shaper curve.

Zairui Li
Electro-Optics Program, University of Dayton, Dayton, OH 45469

Date submitted: 18 Mar 2016 Electronic form version 1.4