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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, JAMES GALLAGHER, JOS MENNDEZ, Department of Physics, Arizona State University, Tempe, AZ, JOHN KOUVETAKIS, Department of Chemistry and Biochemistry, Arizona State University, Tempe, AZ, IMAD AGHA, JAY MATHEWS, Electro-Optics Program, University of Dayton, Dayton, OH and Department of Physics, University of Dayton, Dayton, OH — h $-abstract-$\pard 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.\pard In this work, we report on room temperature lasing in optically-pumped waveguides fabricated from GeSn 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 a clear transition between spontaneous and stimulated emission, thereby demonstrating room temperature lasing.\pard\pard-/abstract-\

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