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Generation of Tunable, Coherent Terahertz Radiation Through Molecular Modulation JOSHUA WEBER, DENIZ YAVUZ, University of Wisconsin-Madison — We introduce and numerically model an approach for generating coherent terahertz radiation. Our method is based on our experimental work with high frequency (10-100 THz) continuous-wave light modulation. We use continuous-wave stimulated Raman scattering inside a high-finesse cavity to modulate light at molecular frequencies. Our simulations demonstrate how this approach could be expanded to generate radiation outside of the optical range. An infrared mixing beam from a semiconductor diode laser could be frequency down-shifted by the molecular modulator in order to generate radiation in the terahertz region of the spectrum. The generated radiation would be easily tunable, as a tuning range of a few tens of nanometers in the diode laser would allow for generation of radiation spanning the entire terahertz region (1-10 THz). We explore the efficiency of this generation using numerical simulations with experimentally available parameters.

Joshua Weber
University of Wisconsin-Madison

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