Abstract Submitted
for the 4CS19 Meeting of
The American Physical Society

Heterogeneous Structures for Improved Terahertz Generation CHARLES BAHR, NATALIE GREEN, LARRY HEKI, Brigham Young University, EMMALEE MCMURRAY TEAM, ISAAC TANGEN TEAM, GABRIEL VALDIVIA TEAM, ERIKA WEIR TEAM, JEREMY JOHNSON TEAM — Terahertz (THz) radiation has a variety of applications including chemical recognition, biomedical imaging, and developing high-speed electronic devices. Currently, the optimal method for creating intense THz radiation involves the conversion of short-pulsed infrared or visible laser light into THz pulses at significantly lower frequencies via optical rectification. Optical rectification is most effectively accomplished using organic crystals with nonlinear optical properties for infrared to THz conversion. Due to the relatively high refractive indices of these crystals, much of the pump laser light entering the crystal as well as generated THz radiation exiting the crystal is lost from reflections at the crystal surfaces. We report on a structure comprised of a layered series of materials with intermediate refractive indices designed to reduce reflective loss and improve THz generation in the organic crystal trans-4′-(dimethylamino)-N-methyl-4-stilbazolium tosylate (DAST). We combine simple theoretical calculations with experimental data to show that a structure comprised of materials with intermediate refractive indices can be used to increase generated THz power up to nearly 50%.

Charles Bahr
Brigham Young University

Date submitted: 13 Sep 2019 Electronic form version 1.4