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

BNA as a broadband THz emitter ISAAC TANGEN, LARRY HEKI, GABRIEL VALDIVIA-BERROETA, ZACHARY ZACCARDI, ERIKA JACKSON, CHARLES BAHR, DAVID MICHAELIS, JEREMY JOHNSON, Brigham Young University - Provo — Terahertz spectroscopy is an emerging field with varied applications, such as imaging of biological samples, probing vibrational modes in crystals, studying interfaces, and identification of a large number of materials. These applications are limited by the THz source: the smaller the frequency range produced, the fewer observables. BNA is an organic nonlinear optical crystal which produces a broadband spectrum from 0.5–6 THz when pumped with a 100-femtosecond laser with a central wavelength of 1200 nm. We have found that pumping very thin (>300 microns) BNA crystals with an 800-nm laser also produces a broadband spectrum in the THz region. We analyze the difference between a 1200-nm and 800-nm pump and find the optimal length for BNA when using each pump. Finally, we demonstrate the use of BNA to determine the refractive index of lithium niobate using THz time-domain spectroscopy and compare our results with the use of DAST, a common organic crystal used for THz generation. Because of the broadband nature of BNA as a THz emitter, BNA is better suited for studying materials from 0–6 THz than other crystals commonly in use.

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Date submitted: 13 Sep 2019 Electronic form version 1.4