Abstract Submitted
for the APR15 Meeting of
The American Physical Society

Generation of strong terahertz field from two-color laser filamentation and optical rectification[1] DONGHOON KUK, YUNGJUN YOO, TAEK IL OH, YONG SING YOU, KI-YONG KIM, Univ of Maryland-College Park — We have demonstrated strong-field (>8 MV/cm), high-peak-power (12 MW) THz generation with a bandwidth of >20 THz via two-color laser filamentation. Moderate average power (1.4 mW) is also achieved by using a cryogenically-cooled Ti:sapphire amplifier capable of producing 30 fs, 15 mJ pulses at a 1 kHz repetition rate. For maximal THz generation and transmission, we have used a combination of a thin dichroic waveplate and a large Brewster-angled silicon filter. Here we have used a thin BBO crystal for frequency doubling (800 nm to 400 nm) and observed strong terahertz emission from the crystal itself. We also find that this type of terahertz emission can be optimized to yield more output power compared to two-color photoionization. In both cases, we have used a microbolometer camera for real-time THz beam profiling. This cost-effective THz camera along with our intense THz sources can be a useful tool for nonlinear THz studies including broadband THz spectroscopy and imaging.

[1]Work supported by DOE, Office of Basic Energy Sciences, Division of Materials Sciences and Engineering under Award No. 014216-001

Ki-Yong Kim
Univ of Maryland-College Park

Date submitted: 09 Jan 2015 Electronic form version 1.4