

Abstract Submitted
for the DAMOP18 Meeting of
The American Physical Society

THz enhanced surface Second Harmonic Generation¹ SANJAY KHATRI, ROBERT JONES, Department of Physics, University of Virginia — When a material is exposed to an intense laser field, the absence of inversion symmetry at the surface can result in the formation of a non-linear surface polarization and surface second harmonic (SSH) emission. We find that the SSH yield from a metal can be dramatically influenced by the presence of an additional THz field. In the experiments, collinear 100fs 780nm laser and 2ps single-cycle THz beams are focused at grazing incidence along a gold surface. The SSH yield is measured as a function of the THz intensity, relative laser-THz delay, and laser/THz polarizations relative to the surface normal. The yield from an optically flat gold mirror increases by as much as a factor of three in the presence of a 50kV/cm THz field. Interestingly, the SSH enhancement for the same THz field is as large as a factor of 15 if the gold mirror is replaced by a gold-coated diffraction grating, apparently due to either a local THz field enhancement or increased sensitivity of the non-linear polarization to the THz field near grating micro-structures. We are exploring the use of THz-enhanced SSH emission to characterize the THz-field enhancement and/or response of micro-structured metal surfaces with other geometries.

¹Supported by U.S. DOE BES, Award DE-SC0012462.

Sanjay Khatri
Department of Physics, University of Virginia

Date submitted: 26 Jan 2018

Electronic form version 1.4