Abstract Submitted
for the TSF16 Meeting of
The American Physical Society

Benchmarking the Response of a Detection System Designed to Measure Hyper-Rayleigh Scattering from Helium MIRIAH PETERSON, JUSTIN PEATROSS, None — We use Rayleigh-scattered 266nm and 400nm light to characterize the absolute efficiency of a high-throughput detection system designed to register photons scattered out the side of a laser focus. Our understanding of linear Rayleigh scattering provides a calibrated photon source that mimics expected nonlinear photoemission scattered out the side of an intense laser focus in a chamber backfilled with helium. These measurements help to place an upper limit on possible incoherent second-harmonic generation produced by intense 800 nm light in helium. We use incoherent third-harmonic emission, scattered out the side of the 800nm laser, as another benchmark comparison. At sufficiently low pressure, direct Hyper-Rayleigh third-order emission from individual atoms is expected to be more prevalent than the less-controllable re-scattering of beam-like coherent third harmonic buildup.

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None

Date submitted: 26 Sep 2016 Electronic form version 1.4