Abstract Submitted
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Harmonic generation from metal nanoparticle arrays[1] MATTHEW MCMAHON, RENE LOPEZ, LEONARD FELDMAN, RICHARD HAGLUND, Vanderbilt University — Metal nanoparticle arrays have optical coherence properties that are predicted to have interesting consequences for optical harmonic generation. We have prepared planar arrays of non-spherically symmetric silver-nanoparticle clusters using a combination of focused ion-beam lithography and pulsed laser deposition. The 150-fs amplified pulses of a Ti:sapphire laser were incident on the array, which was mounted on the rotatable sample stage of a dark-field confocal microscope; this arrangement permits the elimination of virtually all optical background so that the scattered harmonic signal from the array is easily detectable. We describe experiments designed to test a recent theoretical prediction [1] to the effect that the nanoparticle array should produce phase-matched second harmonics like those generated by bulk media without a center of inversion symmetry, and that the harmonic- generation efficiency should scale inversely as the square of the nanoparticle size.[1] N. I. Zheludev and , J. Opt. A: Pure Appl. Opt. 6 (2004) 26-28.

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