

Abstract Submitted  
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**Time-Domain Simulations of the Hyperpolarizability** DENNIS SULLIVAN, University of Idaho, SEAN MOSSMAN, MARK KUZYK, Washington State University — The first hyperpolarizability of a quantum system is the fundamental building block of the nonlinear response of a material to high intensity light, which is the basis for a broad range of phenomena, devices, and applications. However, analytic solutions are rarely available. We present a simulation method based on the finite difference time-domain (FDTD) method which can determine the hyperpolarizability of three-dimensional structures. The accuracy of the method is demonstrated on a clipped harmonic oscillator structure for which analytic solutions are known making it possible to determine the accuracy of the result.

Dennis Sullivan  
University of Idaho

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