# Abstract

## Femtosecond Energy Concentration in Nanosystems: Coherent Control

M. I. STOCKMAN[¶] and S. V. FALEEV

Department of Physics and Astronomy
Georgia State University
Atlanta, GA 30340
USA

Department of Physics and Astronomy
Georgia State University, Atlanta, GA 30340
USA and Sandia National Laboratories
Livermore, CA 94551
USA

mstockman@gsu.edu

**Received**: Mon, 11 Feb 2002 10:29:07

We predict that excitation of a nanosystem with a correspondingly phase-modulated femtosecond pulse can cause concentration of the excitation energy at a small part of that nanosystem [1]. The location of the excited site is coherently controlled by the distribution of the phase along that pulse, distinct from the "Ninth Wave" effect [2]. We discuss unique possibilities of using this in applications, in particular, for nanoscale ultrafast computing and nano-lithography. The theory is based on the Green's function method in the spectral representation [3,4] employed as an analytical approach and implemented as a high-efficiency numerical method in the real 3D space.

REFERENCES

[1] M. I. Stockman, S. V. Faleev, and D. J. Bergman, Phys. Rev. Lett. 88, 067402 (2002).

[2] M. I. Stockman, Phys. Rev. Lett., Vol. 84, 1011 (2000).

[3] D. J. Bergman and D. Stroud, "Properties of Macroscopically Inhomogeneous Media", Solid State Phys., Vol. 46, 147, 1992.

[4] M. I. Stockman, S. V. Faleev, and D. J. Bergman, Phys. Rev. Lett., 87, 167401 (2001).

[¶]Presenter