Title: A Generalized Finite-Difference Time-Domain Scheme for Solving Nonlinear Schrödinger Equations

Time & Location:
2:00pm, Friday, April 12, 2013
TEC 205 (Vislab), Bobby Chain Technology Building

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Abstract:
The nonlinear Schrödinger equation (NLSE) is one of the most widely applicable equations in physical science, and is used to characterize nonlinear dispersive waves, plasmas, nonlinear optics, water waves, quantum computing, and the dynamics of molecules. In this talk, we present an accurate generalized finite-difference time-domain (G-FDTD) scheme for solving nonlinear Schrödinger equations. The new scheme is shown to satisfy the discrete analogous form of conservation law and is tested by examples of bright and dark soliton propagations. Compared with other popular existing methods, numerical results demonstrate that the present scheme provides a more accurate solution.