1106-65-194 **Weizhong Dai*** (dai@coes.latech.edu), Mathematics and Statistics, Louisiana Tech University, Ruston, LA 71272. *Generalized FDTD method for solving Schrodinger equations and open dissipative Gross-Pitaevskii equations.*

In this talk, we present a generalized nite-difference time-domain (G-FDTD) method for solving Schrödinger equations and open issipative Gross-Pitaevskii equations. The idea of this method is first split the unknown function into real and imaginary components resulting in two coupled equations. The real and imaginary components are then approximated using higher-order Taylor series expansions in time and then the derivatives in time are substituted into the derivatives in space via the coupled equations. Finally, the derivatives in space are approximated using higher-order finite difference methods. As a result, the G-FDTD is explicit and permits an accurate solution with simple computation, and also relaxes the stability condition as compared with the original FDTD scheme. The new method is then tested by several examples including soliton propagation and collision,as well as stationary state problem in the non-equilibrium condensate. (Received August 08, 2014)