
Analysis of the nonlinear Diffusion Equation Associated with the Nonlinear Schrodinger Equation

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Abstract

We analyse numerically the Nonlinear Diffusion Equation (NLDE) obtained from the Nonlinear Schrodinger Equation (NLSE). The diffusion process is found to be ballistic. This ballistic behaviour increases with increase in both time and the nonlinear parameter, indicating that the NLDE describes a quantum diffusion process. The nonlinear term is found to increase the rate of spreading or diffusion for > 0 . The dependence of the variance of the distribution function on α and p are determined.