Abstract

We study the Klein-Gordon-Schrödinger equations in the nonrelativistic regime $\epsilon \to 0$ where ϵ is a small parameter proportional to the inverse of the speed of light. We show the Klein-Gordon-Schrödinger equations converge to the nonlinear or linear Schrödinger equations with optimal convergence rate of order ϵ^2. The specific forms of error estimates we derived coincide with the numerical results given by Weizhu Bao's team. This talk is based on collaborations with Weizhu Bao (Singapore), Zhifei Zhang (Bejing), and Zhiwei Zheng (Jinhua).