Title: **A two-component nonlinear Schrödinger system with linear coupling**

Abstract: The effect of an external driven field with Rabi frequency λ in a two-component Bose-Einstein condensate was examined in several physical papers. In this framework an interesting question arises, namely if a two-component Bose-Einstein condensate with one repulsive and one attractive component will collapse or may reach a stable state. Some authors indicated that the use of the Rabi oscillations causes oscillations of the scattering lengths and consequently stabilizes the Bose-Einstein condensate.

In the mathematical framework this is modeled by a nonlinear Schrödinger system with an additional linear coupling. In this setting the above question is reformulated as follows: *does the linear coupling with coefficient λ affect the long time behavior of the system?* In the present work we prove rigorously the asymptotic limit for $|\lambda| \to \infty$ and show convergence of the solution of the system in an appropriate Strichartz' space. Moreover, the solution of the Schrödinger system is proven to exist on a time interval strictly less than the maximal existence time of the limiting system. This implies in the case of global existence of the limiting solution, that the solution of the original system exists on finite time $[0, T]$, with arbitrary T. Therefore, at least for large λ we expect the original nonlinear system to behave like the limiting system, which is a well-known nonlinear Schrödinger system.