Coupled nonlinear Schrödinger equations with a gauge potential

João-Paulo Dias

CMAF-CIO and DM/FCUL, Lisboa

jpdias@fc.ul.pt

We study the solutions of the Cauchy problem for nonlinear Schrödinger system in R^3 with nonlinear coupling and linear coupling modeling synthetic magnetic field in spin-orbit coupled Bose-Einstein condensates. Three main results are presented: a proof of the local existence, a proof of the sufficient condition for the blowup result in finite time for some solutions, and the persistence of the nonlinear dynamics in the limit where the spin-orbit coupling converges to zero. This talk is based in a joint paper with Mário Figueira (CMAF-CIO and DM/FCUL) and Vladimir V. Konotop (CFTC and DF/FCUL), submitted for publication, with title: *Coupled nonlinear Schrödinger equations with a gauge potential: existence and blowup.*