# 学术报告

## A mass conservative and energy diminishing numerical scheme for computing ground state of spin-1 Bose-Einstein condensates

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**Abstract：** A mass (or normalization) and magnetization conservative and energydiminishing numerical method is presented for computing the ground state of spin-1 (or F = 1 spinor) Bose－Einstein condensates (BECs). We begin with the coupled Gross－Pitaevskii equations, and the ground state is defined as the minimizer of the energy functional under two constraints on the mass and magnetization. By constructing a continuous normalized gradient flow (CNGF) which is mass and magnetization conservative and energy-diminishing, the ground state can be computed as the steady state solution of the CNGF. The CNGF is then discretized by the Crank－Nicolson finite difference method with a proper way to deal with the nonlinear terms, and we prove that the discretization is mass and magnetization conservative and energy-diminishing in the discretized level. Numerical results of the ground state and their energy of spin-1 BECs are reported to demonstrate the efficiency of the numerical method.

**欢迎大家参加！**