

DECAY DYNAMICS OF ISOLATED MONOPOLES IN SPINOR BOSE-EINSTEIN CONDENSATES

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Spinor Bose–Einstein condensates (BECs) offer an excellent platform to study various topological defects, such as monopoles [1] and knots [2]. In addition to the superfluidity, spinor BECs of alkali atom gases exhibit magnetic properties due to their spin degrees of freedom. In the recent experiment reporting the observation of isolated monopoles, the defects are created in the polar phase of ^{87}Rb BEC [3]. However, the natural magnetic phase for this atom species is ferromagnetic introducing a dynamical instability from the polar phase towards the ferromagnetic phase [4].

Here we experimentally study the decay of an isolated monopole in ^{87}Rb BEC. The dynamical quantum phase transition from polar to ferromagnetic phase gives rise to the decay process in which an isolated monopole decays into a spin configuration corresponding to a Dirac monopole.

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