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Tunneling of Spinor Bose-Einstein Condensates in Optical Lattice

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Abstract: In this letter, we have studied the tunneling effects and fluctuations of spinor Bose-Einstein condensates in optical lattice. It is found that there exist tunneling effects and fluctuations between lattices l and l+1, l and l-1, respectively. In particular, when the optical lattice is infinitely long and the spin excitations are in the long-wavelength limit, tunneling effects disappear between lattices l and l+1, and l and l-1. In this case the fluctuations are a constant, and the magnetic soliton appears.

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