Bose-Einstein condensates in a rotating lattice[1] LINCOLN D. CARR, Colorado School of Mines, RAJIV BHAT, MURRAY J. HOLLAND, JILA, University of Colorado Boulder and the National Institute of Standards and Technology — Strongly interacting bosons in two dimensions in a rotating square lattice are investigated via a modified Bose-Hubbard Hamiltonian. Such a system corresponds to a rotating lattice potential imprinted on a trapped Bose-Einstein condensate. Second-order quantum phase transitions between states of different symmetries are observed at discrete rotation rates, depending on the lattice filling factor. These rotational quantum phases correspond to increasing numbers of vortices packed on the lattice.

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