Phase transitions in rotating Bose-Einstein condensates\(^1\) MAHIR HUSSEIN, Max Planck Institut für Physik Komplexer Systeme, Dresden, Germany, PIET VAN ISACKER, Grand Accelerateur National d’Ions Lourds, KLAUS BARTSCHAT, Drake University, OLEG VOROV, UNC at Charlotte — The transition to the Abrikosov state has been observed in cold atomic gases. Such critical behavior is very sensitive \([1]\) to the interaction between the particles in the condensate \([2,3]\). We give an analytic description \([1]\) of the phase-transition point and classify the types of the corresponding instabilities that depend on the interaction. This toy model of a continuous phase transition predicts the same behavior patterns for all systems governed by a similar energy functional. \([1]\) O. K. Vorov, P. Van Isacker, M. S. Hussein and K. Bartschat, Phys. Rev. Lett. 95, 230406 (2005). \([2]\) O. K. Vorov, M. S. Hussein and P. Van Isacker, Phys. Rev. Lett. 90, 200402 (2003). \([3]\) O. K. Vorov, P. Van Isacker, M. S. Hussein and K. Bartschat, to be submitted to Nature (2007).

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