

Abstract Submitted
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Pairing, ferromagnetism, and condensation of a normal spin-1 Bose gas STEFAN NATU, ERICH MUELLER, Cornell University — We theoretically study the stability of a normal, spin disordered, homogenous spin-1 Bose gas against ferromagnetism, pairing, and condensation through a Random Phase Approximation which includes exchange (RPA-X). Repulsive spin-independent interactions stabilize the normal state against both ferromagnetism and pairing, and for typical interaction strengths leads to a direct transition from an unordered normal state to a fully ordered single particle condensate. Atoms with much larger spin-dependent interaction may experience a transition to a ferromagnetic normal state or a paired superfluid, but, within the RPA-X, there is no instability towards a normal state with spontaneous nematic order. We analyze the role of the quadratic Zeeman effect and finite system size.

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