

Abstract Submitted  
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**Use of the ground state of a BEC in a double-well trap in quantum metrology** HAN CHEN, JUHA JAVANAINEN, U of Connecticut — The ground state of a Bose-Einstein condensate with attractive atom-atom interactions in a double-well trap is close to the NOON state. We discuss Heisenberg-limited atom interferometry starting with this state. We identify the dimensionless parameter governing the quality of the ground state for the purposes of quantum metrology. The ground state and the lowest-energy excited state become degenerate in the limit of strong atom-atom interactions, and thermal preparation of a state useful for precision measurements does not appear feasible.

Juha Javanainen  
Univ of Connecticut - Storrs

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