

Josephson Effect in Superfluid Fermi Atoms at Finite Temperature

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Abstract

By using Green's function method the Josephson effect of neutral fermions in the crossover from the Bardeen-Cooper-Schrieffer state of weakly bound Cooper pairs to the Bose-Einstein condensate of strongly bound molecular dimers at finite temperature is investigated. Four different hyperfine states of the atoms are assumed to be trapped and to form two superfluids via the BCS-type of pairing. We show that Josephson oscillations can be realized by coupling the superfluids with two laser fields. The laser interaction is assumed to be a small perturbation and its effect is calculated using linear response theory.