Quantum fluctuations of the ultracold atom-molecule mixtures

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We investigate emergence of the quantum coherence in the ultracold mixture of fermionic atoms and bosonic dimer molecules. Interactions between these species can be there experimentally controlled via tuning the external magnetic field. In consequence the fermionic atoms and their bosonic counterparts can be driven to a correlated behavior which resembles the usual BCS to BEC crossover scenario. We analyze this issue in some detail. In particular we comment on the recent experiments using the fast sweep across the Feshbach resonance which induce the fluctuations analogous to the superradiant state originally discussed by von Dicke.

9.7 cm

13.4 cm

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