

Correlation Effects in a Trapped Bose-Fermi Mixture: Exact Results

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An exactly solvable model of a trapped Bose-Fermi mixture is presented and worked out. The wavefunction, energy, and entanglement between the fermions and bosons in the ground state are presented in closed form and analyzed. As a first application, we construct and investigate the exact first-order and second-order correlations functions of a fermionic impurity in a bosonic bath. The explicit features in the intra-species and especially the inter-species correlation functions signaling distinct many-body effects are pointed out. Discussion of and comparison to properties from an exactly solvable model of a trapped Bose-Bose mixture [1-6] are made.

References

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