

MCTDHF&B for Correlated Quantum Systems

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I will introduce the multi-configuration time-dependent Hartree method for computing the dynamics of fermionic and bosonic few body systems and Bose-Einstein condensates beyond the Gross-Pitaevskii equation. Potential applications comprise the ionization of molecules by strong laser pulses, scattering problems in the presence of external field, relaxation multiply charged quantum-dots, and relaxation and control of cold bosonic systems. I will try to demonstrate potential and limitations of the approach and point out key computational and mathematical issues.