Abstract Submitted
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A numerical approach to few-atom dynamics in one dimension LI YANG, HAN PU, LIN DONG, Rice Univ — We develop a numerical approach based on the Time-Evolution-Block-Decimation (TEBD) method to study the dynamics of one-dimensional system consisting of a few ultracold atoms. As an example, we investigate the ferromagnetic transition of a two-component Fermi gas. Recent study has shown that for such a system, a ferromagnetic transition is expected to occur when the 1D interaction strength diverges. We study how this transition occurs in real time when the interaction strength is varied and a very small magnetic field gradient is present. We also discuss the eigenstates and eigenenergies of a two-particle system in the presence of a magnetic gradient and compare our numerical calculation with a semi-analytic model.

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