Abstract Submitted
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The Operator Product Expansion Beyond Leading Order for Spin-1/2 Fermions[1] SAMUEL EMMONS, Univ of Tennessee, Knoxville, DAEKYOUNG KANG, Theoretical Division, LANL, LUCAS PLATTER, Univ of Tennessee, Knoxville; Physics Division, ORNL — Strongly interacting systems of ultracold, two-component fermions have been studied using various techniques for many years. One technique that has been applied is a quantum field theoretical formulation of the zero-range model. In this framework, the Operator Product Expansion was used to derive universal relations for systems with a large scattering length[1]. This corroborated and extended the work of Tan[2-4]. We calculate finite range corrections to the momentum distribution using the OPE framework and demonstrate the utility of including the $1/k^6$ tail from the OPE for the momentum distribution. Corrections to the universal relations for the system are calculated and expressed in terms of the S-wave effective range and an additional quantity D similar to Tan's contact which, in addition to the contact, relates various physical observables. We compare our results with quantum Monte Carlo calculations for the two-component Fermi gas with large scattering length.

References:
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