

Abstract Submitted
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Variational and Coupled Cluster Method for Many-Particle Systems JAY D. MANCINI, Kingsborough College of CUNY, VASSILIOS FESSATIDIS, Fordham University, SAMUEL P. BOWEN, Chicago State University, WILLIAM J. MASSANO, SUNY Maritime — The use of canonical transformations in both quantum chemistry and physics in the construction of effective Hamiltonians has long been a useful tool in the hands of theoreticians. Here we wish to revisit the basic tenets of the Coupled Cluster Method, wherein the exponentials appearing in the transformed Hamiltonian $e^{-S}He^S$ are expanded out. These terms are then recombined to form the basis states of a recently developed variational scheme. Here the operator $S = \sum_n \lambda_n s_n$ represents the excitations of the system. We then apply this new method to a number of Hamiltonian systems.

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