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Coupled Cluster Approximation to the t-J Model JAY D. MANCINI, Kingsborough College of CUNY, Brooklyn, NY, VASSILIOS FESSATIDIS, Fordham University, Bronx, NY, SAMUEL P. BOWEN, Chicago State University, Chicago, IL — We study the ground state of the one-dimensional t-J model with a single hole using the well known Coupled Cluster Method (CCM). The Hamiltonian includes a kinetic energy term t which represents electron hopping from atomic site to atomic site with a probability which is proportional to the overlap of their (localized) wave functions. There is also an intra-atomic Coulomb energy U taken to be large so that the region of parameter space of interest is $t/U \ll 1$. The CCM is a well-known scheme for evaluating many-particle systems wherein an operator S is introduced as $|\Psi\rangle = e^s |\Psi_0\rangle$ and represents the many-particle excitations of the system. A set of non-linear equations are then generated from $\langle\Psi_0| H |\Psi_n\rangle = 0$ and $\langle\Psi_0| H |\Psi_0\rangle = E_0$ in which the ground state energy may then be calculated.

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