Bosonic Atom-Molecule Conversion in an Optical Lattice using Quantum Monte Carlo JEROME SANDERS, JUHA JAVANAINEN, University of Connecticut — We study the conversion of bosonic atoms to bosonic molecules in an optical lattice via Quantum Monte Carlo (QMC) simulation. The simulation determines the ground state of the many body system in a one-dimensional lattice with periodic boundary conditions. The governing Hamiltonian allows for the tunneling of atoms, the association of atoms, and the dissociation of molecules at any lattice site. This method allows us to study the averages of several runs as well as results from individual runs that may prove to be interesting, but disappear when averaged. We describe the verification and preliminary results of the method on small atom-molecule clusters.

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