A Numerically Exact Path Integral Approach for Time-Dependent Wave Functions[1] TORREY SAXTON, ALLISON HARRIS, Illinois State University — The Path Integral technique is an alternative formulation of quantum mechanics that is based on a Lagrangian approach. In its exact form, it is completely equivalent to the Hamiltonian-based Schrödinger equation approach. Developed by Feynman in the 1940's, following inspiration from Dirac, the path integral approach has been widely used in high energy physics, quantum field theory, and statistical mechanics. However, only in limited cases has the path integral approach been applied to quantum mechanical few-body scattering. We will present a theoretical and computational development of the path integral method for use in the study of atomic collisions. Preliminary results will be presented for some simple systems, and numerical challenges will be discussed.

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