Path Integral Approach to Atomic Collisions[1] 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 present a
theoretical and computational development of the path integral method for use in
the study of atomic collisions. Preliminary results are presented for some simple
systems. Ultimately, this approach will be applied to few-body ion-atom collisions.

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