

Abstract Submitted
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Two-Dimensional Heavy-Ion Scattering using the PIQTr Model¹

ZACHARY TEMPLE, TORREY SAXTON, ALLISON HARRIS, Illinois State University — Heavy-ion charged particle collisions have important applications in fields such as astrophysics, biophysics, and plasma physics, and from a fundamental standpoint, provide valuable information about the few-body problem. Current theoretical atomic collision models work well for electron projectiles, but heavy-ion projectiles continue to present a challenge for even the most advanced models. To help address these challenges, we have developed the Path Integral Quantum Trajectory (PIQTr) model for the calculation of time-dependent wave functions. The method is numerically exact and has been successfully applied to particles moving in one dimension. These results show a favorable scaling in computational requirements as the mass of the projectile increases, and in general, the model has been shown to work well for heavy ions. We have now extended our method to charged particles moving in two dimensions. Here we present time-dependent numerical results for various different charged particles and discuss applications to heavy-ion atomic collisions.

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