

Abstract Submitted
for the DAMOP08 Meeting of
The American Physical Society

Creation, propagation and destruction of vortices in single atom wave functions for ion-atom collisions¹ JAMES STERNBERG, University of Tennessee, J.H. MACEK, SERGE OVCHINNIKOV, University of Tennessee and Oak Ridge National Laboratory, TECK-GHEE LEE, D.R. SCHULTZ, Oak Ridge National Laboratory — Vortices are a nearly ubiquitous feature of nature. It is well known that they form in large scale processes such as weather, but they are also formed in the quantum realm. One place where they can be seen quite clearly is in the wave functions for ion- atom collisions at a set impact parameter. In this work we use a very low noise and highly accurate numerical method to propagate the time dependent Schrödinger equation (TDSE) for such a collision. With this method we see the formation of vortices in the wave function, the interaction between them and their destruction. We also observe how the transport of angular momentum by vortices affects the overall behavior of the wave function.

¹This work is supported under DOE grant DE-FG02-02ER15283.

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Date submitted: 31 Jan 2008

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