Abstract Submitted
for the APR08 Meeting of
The American Physical Society

Theoretical Fully Differential Cross Sections for Four-Body Processes A.L. HARRIS, J.L. PEACHER, M. SCHULZ, D.H. MADISON, Missouri University of Science and Technology — Atomic collisions present a valuable opportunity to study the few body problem. Advances on the theoretical side now allow for an essentially exact numerical calculation of one of the simplest the few-body problems - the three-body problem. However, study of the four-body problem is still in its infancy, and the agreement between experiment and theory for kinematically complete experiments is far from satisfactory. The simplest four-body problem is a charged particle collision with helium in which both atomic electrons change state. Two theoretical models will be discussed for several possible outcomes of this type of collision. The first Born approximation (FBA) treats the projectile as a plane wave, and ignores the post collision Coulomb interaction between the two final state continuum electrons. The more sophisticated four-body distorted wave (4DW) model treats all continuum particles as distorted waves and explicitly includes the post collision Coulomb interaction between the two outgoing electrons. Fully differential cross sections calculated using the FBA and 4DW models will be compared to absolute experimental results, as well as other theories.

Allison Harris
Missouri University of Science and Technology

Date submitted: 07 Jan 2008 Electronic form version 1.4