

Abstract Submitted
for the DAMOP08 Meeting of
The American Physical Society

Double ionization of helium by ion impact assessed using four-body Dalitz plots¹ MARCELO CIAPPINA, MPI f. komplexe Systeme Dresden, MICHAEL SCHULZ, Missouri University of Science & Technology, TOM KIRCHNER, TU Clausthal, DANIEL FISCHER, ROBERT MOSHAMMER, JOACHIM ULLRICH, MPI f. Kernphysik Heidelberg — We have performed experimental and theoretical studies of double ionization (DI) of helium by 6 MeV proton impact using a recently developed tool: four-particle Dalitz plots.² These plots are basically an extension of conventional Dalitz plots originally introduced in particle physics to analyze three-body fragmentation processes. DI represents a *four-body* fragmentation process and consequently an extra dimension needs to be incorporated. Four-particle Dalitz plots are very powerful because they enable the representation of multiple differential cross sections as a function of all four fragments in a single spectrum without loss of any part of the total cross section. As a result, the relative importance of the various interactions between the fragments can be studied in great detail. Our results suggest that an uncorrelated DI mechanism, involving two independent interactions of the projectile with both electrons, is significantly more important than previously expected for such fast collisions.

¹Work supported by NSF

²M. Schulz *et al*, J. Phys. B22, 3091 (2007)

Michael Schulz
Missouri University of Science & Technology

Date submitted: 25 Jan 2008

Electronic form version 1.4