

Abstract Submitted
for the MAR13 Meeting of
The American Physical Society

Computation of Low-Energy Positronium-Hydrogen Collisions using the Kohn Variational Method¹ DENTON WOODS, S.J. WARD, University of North Texas, P. VAN REETH, University College London — The Kohn variational method is an established method that can provide benchmark calculations for quantum few-body systems. We consider the four-body Coulomb process of positronium-hydrogen (Ps-H) scattering. We improve upon the numerics of prior accurate S- and P-wave Kohn variational calculations of Ps-H elastic scattering [1,2]. For instance, we use a procedure that removes Hylleraas-type terms that lead to linear dependence [3]. In addition to using the Kohn and inverse Kohn variational methods as previously used, we use the generalized and complex Kohn variational methods [4]. We are extending the calculations of Ps-H to include the D-wave.

[1] P. Van Reeth and J. W. Humberston, *J. Phys. B* **36**, 1923 (2003).

[2] P. Van Reeth and J. W. Humberston, *Nucl. Instrum. Methods B* **221**, 140 (2004).

[3] A. Todd, Ph.D. thesis, The University of Nottingham, (2007), *unpublished*.

[4] J.N. Cooper, M. Plummer, and E.A.G. Armour, *J. Phys. A* **43**, 175302 (2010).

¹S.J.W. acknowledges support from NSF under grant no. PHYS-968638.

Denton Woods
University of North Texas

Date submitted: 27 Nov 2012

Electronic form version 1.4