

Abstract Submitted
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Low-energy S- and P-wave Positronium-Hydrogen Collisions¹

DENTON WOODS, S.J. WARD, University of North Texas, P. VAN REETH, University College London — Positronium-atom scattering is of experimental interest. We have investigated low-energy positronium-hydrogen scattering, a fundamental four-body Coulomb process. We computed the S- and P-wave phase shifts using a number of variants of the Kohn variational method. For the S-wave, we implemented various techniques to overcome linear dependence problems. Our results compare favorably with earlier Kohn variational calculations [1]. We determined the S-wave scattering length and effective range using a quantum defect theory for the van der Waals interaction [2].

[1] P. Van Reeth and J. W. Humberston, *J. Phys. B* **36**, 1923 (2003), *Nucl. Instrum. and Methods Phys. Res. B* **221**, 140 (2004).

[2] Bo Gao, *Phys. Rev. A* **58**, 4222 (1998).

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