

Abstract Submitted
for the DAMOP18 Meeting of
The American Physical Society

Vortices for Ps formation in positron-hydrogen collisions in the Ore gap S. J. WARD, ALBANDARI W. ALROWAILY⁺, University of North Texas, P. VAN REETH, University College London — Using the inverse Kohn variational method, we determine the differential cross section (DCS) for Ps formation in positron-hydrogen collisions in the Ore gap. There are two deep minima in the DCS in this energy range. At the minima, the nodal lines of the real and imaginary parts of the Ps-formation scattering amplitude intersect which means that the amplitude is zero. Corresponding to the zeros in the Ps-formation scattering amplitude there are vortices in the velocity field that is associated with this amplitude. The velocity field rotates about each zero, but in opposite directions. The magnitude of the circulation [1] for the first and second zeros is $2\pi/M$ and $-2\pi/M$, respectively, where M is the mass of the outgoing Ps.

⁺Home Institution: Princess Nourah bint Abdulrahman University

S.J.W. acknowledges support from NSF under Grant No. PHYS-1707792.

Computational resources were provided by UNT's High Performance Computing Services.

[1.] Iwo Bialynicki-Birula, Zofia Bialynicka-Birula, and Cezary Śliwa, Phys. Rev. A **61**, 032110 (2000).

S. J. Ward
University of North Texas

Date submitted: 12 Jan 2018

Electronic form version 1.4