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**Positronium and electron scattering on Helium**

JOSEPH DI RIENZI, College of Notre Dame of Maryland, RICHARD DRACHMAN, NASA/Goddard Space Flight Center — A recent work [1] establishes experimentally that Positronium scattering by atoms of various elements is surprisingly close in total cross-section to that of an isolated electron of the same velocity. In this work we will look at the scattering of Ps on Helium and compare it to a determination of the scattering of an e- with the same element. For both the Ps scattering and the e- scattering on He, we assume the symmetrization of the e- with the closed shell He electrons is the dominant interaction. A local effective potential employed in [2] and [3] is used to model the electron exchange and cross- sections are determined for a set of partial waves. For the Ps scattering we include as a secondary effect the Van der Waals interaction. For single e- scattering of He, we also employ a short range Coulomb potential and dispersion as contributing effects. Results of the cross-sections determined in each case are then compared. [1] S. J. Bromley, S. Armitage, J. Beale, D. E. Leslie, A. I. Williams, G. Laricchia, *Science* 330, 789 (2010) [2] R. J. Drachman, S.K. Houston, *J. Phys. B: At. Mol. Phys.* 3 1657 (1970) [3] J. Di Rienzi, R. J. Drachman, *J. Phys. B.* 36 2409 (2003)

  

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