

The Binding Energy of PsH

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In response to proposed measurements of Ps scattering by the St. Olaf's positron experimental group [1], we have begun a theoretical investigation of Ps scattering from simple atoms. For our first step of this investigation, we have computed the binding energy of the fundamental four-body Coulomb system, PsH. We have used a very flexible trial function of Hylleraas form which includes all inter-particle distances. Our most accurate value of the binding energy compares favorably with a previous calculation that also used Hylleraas functions [2] and with the most accurate calculation to-date which used explicitly correlated Gaussians [3].

[1] Jason Engbrecht, *Private communication*, (2008).

[2] Zong-Chao Yan and Y. K. Ho, *Phys. Rev. A* **59**, 2697 (1999).

[3] Sergiy Bubin and Ludwik Adamowicz, *Phys. Rev. A* **74**, 052502 (2006).