Scattering of near-zero-energy positronium by H$_2$ JUN-YI ZHANG, Division of Physical Science & Engineering, King Abdullah University of Science and Technology, Thuwal 23955-6900, Saudi Arabia, YING QIAN, Department of Computer Science and Technology, East China Normal University, Shanghai 200241, China, YU-JUN YANG, Institute of Atomic and Molecular Physics, Jilin University, Changchun 130012, China, ZONG-CHAO YAN, Department of Physics, University of New Brunswick, Fredericton E3B 5A3, Canada, UDO SCHWINGENSCHLÖGL, Division of Physical Science & Engineering, King Abdullah University of Science and Technology, Thuwal 23955-6900, Saudi Arabia — The scattering length and pick-off annihilation parameter for the S-wave scattering of zero-energy positroniums (Ps) by H$_2$ are calculated by the stabilization method using explicitly correlated Gaussians. The confined variational method is used to optimize the Gaussians in order to describe the short-range interaction of the incident Ps with H$_2$ in the fixed nucleus approximation. By applying a confining potential to the center-of-mass of Ps, the problem of continuum states can be converted to a problem of discrete energy levels. For scattering at very low energies, the convergence of the scattering parameters can be improved by including exterior basis functions to describe the asymptotic region, which are given by products of Guassians with H$_2$ wave function and Ps wave function. In addition, the effect of van der Waals interaction between the Ps and H$_2$ on scattering parameters will be taken into account.

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