

Resonances in positronium hydride and lithium-like ions

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Precise determination of resonance parameters for few-body atomic systems is a challenging subject in atomic physics. The central problem is the adequate inclusion of electron-electron (positron) correlations. Recent progress in variational calculations for lithium [1] using fully-correlated Hylleraas coordinates has made it possible to perform precision calculations of resonance parameters (energy and width) in the frame of complex coordinate rotation [2] In this paper, we will focus on positronium hydride (PsH) and the atomic lithium and its ions. Two new resonances of F and G symmetries in PsH and the resonance parameters for the lowest S and P symmetries in Li and Li-like ions will be presented. With recent advances of synchrotron radiation sources, our work may become a timely challenge to experimentalists.

[1] Z.-C. Yan and G. W. F. Drake, Phys. Rev. Lett. **81**, 774 (1998).

[2] Y. K. Ho, Phys. Rep. **99**,1 (1983).