Hydrogen molecular ions: status of theory

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Thanks to impressive progress in experimental accuracy, spectroscopy of the HD^+ molecular ion has contributed to improved determinations of mass ratios, such as m_p/m_e, in the latest CODATA adjustment [1, 2]. The precision of these measurements can be expected to improve further in the next few years. Moreover, efforts have been recently extended to H_2^+ [3, 4], and spectroscopy of single HD^+ ions in a Penning trap offers the possibility of measuring hyperfine intervals and the bound-electron g-factor [5].

I will describe the current status of theory and ongoing work on the spin-averaged energy levels [6], hyperfine structure [7], and electronic g-factor [8].

References

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