Spherically Symmetric Approximation (and beyond) in Relativistic Schroedinger Theory

The energy eigenvalue problem of non-relativistic positronium is considered within the framework of Relativistic Schroedinger Theory (RST), and the results are compared to those of the conventional quantum theory. For the range of princi- pal quantum numbers $n = 2;3;\ldots;30$, the RST predictions for the non-relativistic positronium energies deviate now from the corresponding predictions of the conven- tional quantum theory at an average of (roughly) 3%. These results suggest that the deviations will be further diminished in the higher orders of approximation.

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