Energy Spectra of the Confined Atoms Obtained by Using B-Splines

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Abstract: We have calculated the energy spectra of one- and two-electron atoms (ions) centered in an impenetrable spherical box by variational method with B-splines as basis functions. Accurate results are obtained for both large and small radii of confinement. The critical box radius of confined hydrogen atom is also calculated to show the usefulness of our method. A partial energy degeneracy in confined hydrogen atom is found when the radius of spherical box is equal to the distance at which a node of single-node wavefunctions of free hydrogen atom is located.

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