Remarks on Local Energy and Perturbations

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The local energy is first reviewed and compared with the expected energy. We then present the perturbative local energy method which uses an exactly soluble base problem and a perturbing potential to greatly simplify the expression of the local energy. This is demonstrated with two-electron atoms for which the method gives upper bounds with errors from 18% for He to 4% for Ne$^8+$. Finally a call to develop a local energy method for large systems is issued.

Key words: Local Energy; Variation Theorem; Perturbations.