# Potential Energy Expectation Value for Lithium Excited State (1s2s3s)

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**Abstract :** The purpose of the present work is to calculate the expectation value of potential energy $<V>$ for different spin states ($\alpha\alpha\alpha \equiv \beta\beta\beta$, $\alpha\beta\alpha \equiv \beta\alpha\beta$) and compare it with spin states ($\alpha\beta\beta$, $\alpha\alpha\beta$ ) for lithium excited state (1s2s3s) and Li-like ions (Be+, B+2) using Hartree-Fock wave function by partitioning technique. The result of inter particle expectation value shows linear behaviour with atomic number and for each atom and ion the $<V>$ shows the trend $\alpha\alpha\alpha < \alpha\alpha\beta < \alpha\beta\beta < \alpha\beta\alpha$.

**Keywords :** lithium excited state, potential energy, 1s2s3s, mathematical physics
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