## Angular Correlation and Independent Particle Model in Two-Electron Atomic Systems

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**Abstract :** The ground and low-lying singly-excited states of He and He-like atomic ions have been studied by the Full Configuration Interaction (FCI) method focusing on the angular correlation between two electrons in the studied systems. The two-electron angle density distribution obtained by integrating the square-modulus of the FCI wave function over the coordinates other than the interelectronic angle shows a distinct trend between the singlet-triplet pair of states for different values of the nuclear charge Zn. Further, both of these singlet and triplet distributions tend to show an increasingly stronger dependence on the interelectronic angle as Zn increases, in contrast to the well-known fact that the correlation energy approaches towards zero for increasing Zn. This controversial observation has been rationalized on the basis of the recently introduced concept of so-called conjugate Fermi holes.

Keywords : He-like systems, angular correlation, configuration interaction wave function, conjugate Fermi hole

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