



ECT*
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IN NUCLEAR PHYSICS AND RELATED AREAS



UNIVERSITY OF TORONTO
LECTURE 4
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Structure Characteristics of Light Nuclei Calculated within the Variational Approach

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A method is developed to solve the few-body problem for systems of quantum particles in the bound states. In the framework of the variational method in the Gaussian representation, the structure characteristics of light nuclei ${}^6\text{Li}$, ${}^6\text{He}$, ${}^{10}\text{Be}$, ${}^{10}\text{C}$, ${}^{14}\text{C}$, ${}^{14}\text{N}$, ${}^{14}\text{O}$ are studied within three-, four-, and five-cluster models (α -clusters plus two extra nucleons). Specific properties of the charge density distributions, formfactors, pair correlation functions, and the momentum distributions of these nuclei are analyzed. Within the same approach, formfactors and density distributions of ${}^{12}\text{C}$, ${}^{16}\text{O}$, and ${}^{20}\text{Ne}$ nuclei are calculated in the framework of the α -cluster model.

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