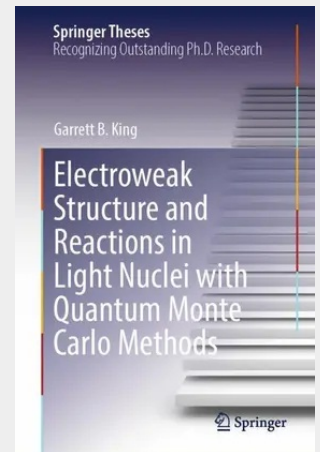


Electroweak Structure and Reactions in Light Nuclei with Quantum Monte Carlo Methods

This book details quantum Monte Carlo computational methods to study electroweak structure and reactions in light nuclei across a wide range of experimentally relevant kinematics. Nuclei will play a prominent role in searches for physics beyond the standard model as the active material in experiments, and so in order to reliably interpret new physics signals, one needs an accurate model of the underlying nuclear dynamics. This thesis explores key topics such as beta-decay rates, muon capture, and electromagnetic moments and form factors, providing important theoretical predictions for both the standard model and searches for new physics. This book documents the application of models incorporating two- and three-nucleon interactions, as well as many-nucleon electroweak currents, thus contributing to precision tests of nuclear physics.

1. Introduction.- 2. Nuclear model from chiral effective field theory.- 3. Quantum Monte Carlo methods.- 4. Gamow-Teller β -decay in light nuclei.- 5. Partial muon capture rates for $A = 3$ and $A = 6$ nuclei.



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