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A review of nuclear clustering formulation

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Nuclear cluster models are a means to describe complex many body systems, specifically to predict nuclear structure properties within strongly correlated subsystem of nucleons. The binary cluster model has shown some success in predicting the alpha decay and spontaneous fission half-lives. A relativistic description of the Binary Cluster Model using the Dirac formulation treats spin correlations in a more natural way.

The objective of this study is to develop a fully microscopic description of the nuclear clustering based on a relativistic mean field theory. So doing, extending the application of the model to a greater range of observables, testing it in scattering phenomena and Colinear Cluster Tri-Partition (CCT). This presentation which gives an overview of binary clustering model and the formalism used identify the core-cluster partition and corresponding nuclear cluster observables. A comparison with existing phenomenological and non-relativistic Brueckner G-Matrix model predictions will be done.

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