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Generator coordinate method with variational basis generation

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The generator coordinate method (GCM) has been utilized to describe the nuclear collective motion including the cluster structure. The GCM trial function is given by a coherent superposition of Slater determinants (SDs) fixed within some collective space, which has been a priori selected. The energy variation is then made only for the weight function. In this talk, we present a GCM with the basis SDs optimized as well according to the variational principle. With such simultaneous optimization of the basis states, one does not have to specify beforehand the relevant collective or cluster degrees of freedom covered by the set of basis SDs. We apply the method to a schematic model and discuss the difference between our method and the other beyond-mean-field methods.

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