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Current Status of Very-Large-Basis Hamiltonian Diagonalizations for Nuclear Physics

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Today there are a plethora of many-body techniques for calculating nuclear wave functions and matrix elements. I will review the status of that reliable workhorse, the interacting shell model, a.k.a. configurationinteraction methods, a.k.a. Hamiltonian diagonalization, and survey its advantages and disadvantages. With modern supercomputers one can tackle dimensions up to about 20 billion! I will discuss prospects for going even further, and what one hopes to learn.

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