Applications of Effective Operators within the NCSM BRUCE R.
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VARY, Iowa St. U. — The no-core shell model (NCSM) is a powerful many-body
method which provides the solution to the Schrödinger equation for A interacting
nucleons in a restricted space. Starting from realistic nucleon-nucleon interactions
that accurately fit the experimental phaseshifts, we use a unitary transformation
approach to obtain an effective interaction in the model space (realistic three-nucleon
forces can be also implemented, but we restrict the discussion to two-body forces).
The same renormalization procedure can be applied to other operators, obtaining
results consistent with the NCSM wave functions. In our presentation we will discuss
renormalization of short- and long-range operators, as well as the latest applications
of the NCSM to the description of ground- and excited-state properties. I.S. and
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