

Density-independent interactions for nuclear structure calculations

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We present a new two-body finite-range and momentum-dependent but density-independent effective interaction which can be interpreted as a regularized zero-range force. We show that no three-body or density-dependent terms are needed for a correct description of all saturation properties in infinite matter but the isoscalar effective mass which is too low. The new interaction gives a satisfying equation of state of nuclear matter and opens up extremely interesting perspectives for the mean-field and beyond-mean-field descriptions of atomic nuclei. We will present some preliminary results for infinite nuclear matter and ground states of nuclei and discuss how the isoscalar effective mass may be improved.

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