Occupation-number-based energy functional for nuclear masses

MICHAEL BERTOLLI, University of Tennessee — We consider an occupation-number based nuclear energy functional. It is based on the theorems by Hohenberg and Kohn, and the practical implementation follows the ideas of the mass formula by Duflo and Zuker. The global fit of a 15-parameter functional to known masses yields a RMS error of 0.95MeV with good extrapolation properties. This approach to nuclear masses is computationally much less expensive than nuclear density functionals. A simple model for nuclear radii also yields a satisfactory description of charge radii.

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