Fully self-consistent Relativistic Brueckner-Hartree-Fock theory for nuclear matter

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Purpose To develop fully self-consistent RBHF theory for nuclear matter with negative-energy states (n.e.s.).

Outline Due to distinct approximation on single-particle potentials, the RBHF calculations for nuclear matter fail to reach agreement with each other. With n.e.s. included, the single-particle potentials especially their momentum dependence are determined uniquely. The fully self-consistent RBHF theory for nuclear matter is developed.

Result The discrepancy among RBHF calculations is clarified. The saturation properties for nuclear matter are described by the fully self-consistent RBHF theory.

Computing system: OCTOPUS
node-hour: 117.99
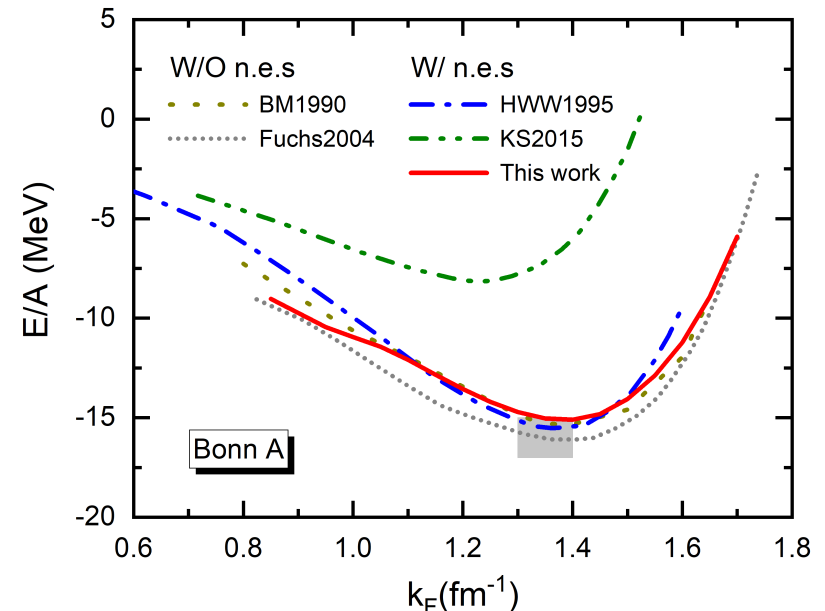memory used: 0.9 GB
parallelize: 1 node

Figure. Equation of states calculated with RBHF theory with interaction Bonn A.