

Abstract Submitted  
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**An explicit energy functional for neutron matter taking into account the spin-orbit force** MASATOSHI TAKANO, KOHEI KATO, Waseda University — We have been studying the variational method with an explicit energy functional for infinite nuclear matter. In this method, we construct an energy functional which expresses the energy per nucleon of nuclear matter explicitly with various two-body distribution functions. Once a reliable energy expression is obtained, the Euler-Lagrange equations for those distribution functions are derived analytically, and the fully minimized energies are calculated relatively easily. So far, we have proposed the energy expressions with two-body central and tensor forces. The calculated energies with the AV6' potential are reasonable as compared with those obtained with the Monte Carlo methods. Furthermore, in the last JPS meeting, we reported on an energy expression for neutron matter including two-body spin-orbit forces: The preliminary results of the energy with the AV8' potential are in good agreement with those with the AFDMC calculations. In this presentation, we will report on an extension of the energy functional for neutron matter so as to treat the repulsive part of the UIX three-body potential. An extension of this variational method to hot nuclear matter will also be reported.

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