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Properties of Cold and Hot Polarized Nuclear Matter with Realistic Nucleon Nucleon Interaction

S. A. MOHARRAM

Department of Physics, Faculty of Science, University of Cairo,
Giza-EGYPT

e-mail: elnaghy@hotmail.com

 [Keywords](#)
[Authors](#)



phys@tubitak.gov.tr

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Abstract: The Thomas-Fermi (TF) model is used to calculate the equation of state of thermal polarized nuclear-matter (NM) within a nonrelativistic Hartree-Fock (HF) scheme. The potential employed is a new realistic version of the density-dependent M3Y effective nucleon-nucleon (NN) interaction where the Yukawa strengths are based on the G-matrix of the Paris interaction. To study the basic properties of asymmetric nuclear matter, this potential is generalized by introducing spin and spin-isospin components into the original M3Y effective NN interaction. The resulting equation of state (EOS) is soft. The results obtained are in reasonable agreement with previous theoretical estimates.

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