Turkish Journal of Physics

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Spin Polarized Cold and Hot Dense Neutron Matter

S. A. MOHARRAM Department of Physics, Faculty of Science, Cairo University, Cairo-EGYPT Azza O. El-SHAL Mathematics and Theoretical Physics Department, Nuclear Research Center, Atomic Energy Authority Cairo-EGYPT
Abstract :The Thomas-Fermi (TF) model is used to calculate the equation of state of thermal polarized neutron matter. The properties of cold and hot neutron matter have been investigated. A realistic density-dependent M3Y effective nucleon-nucleon (NN) interaction where the Yukawa strengthes are based on the G-matrix of the Paris interaction has been used. Special attention is devoted to the effect of the spin excess parameter on these properties. Moreover, the effect of some realistic density dependence has been studied. The results obtained are in reasonable agreement with previous theoretical estimates using different methods of calculation.

Key Words: Neutron Matter, Equation of State, M3Y effective interaction