od. The important nucleon resonances predicted by the constituent quark model (CQM) are considered and the results are found to be well comparable with the experimental data. Besides the dominant $D_{13}(2080)$, the resonance $[(5/2)^-]_2(2080)$ predicted by the CQM is found to be important for reproducing the experimental data. Other nucleon resonances are found to give small contributions in the channel considered. Via the Initial Single Pion Emission (ISPE) mechanism, the $\varphi(1020)\pi^+$ invariant mass spectrum distribution of $Y(2175)\to\varphi(1020)\pi^+\pi^-$ has been studied[11]. The $\varphi(1680)\to\varphi(1020)\pi^+\pi^-$ process due to the ISPE mechanism has also been investigated. The obtained results suggest to carry out the search for these charged strangeoniumlike structures in future experiments, especially Belle II, Super-B and BESIII. Inspired by the observed Y(2175) state, its nonstrange partner Y(1915), which has a resonance structure with mass around 1915 MeV and width about 317～354 MeV, has been predicted[12]. Experimental search for Y (1915) is proposed.

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1 - 2 Three-body Force Effect on Off-shell Mass Operator and Spectral Functions in Nuclear Matter

Zuo Wei, Wang Pei, Gan Shengxin and Yin Peng

Nucleon spectral function in nuclear matter is of special interest since it may play an important role in understanding the nature of the nucleon-nucleon correlations, especially the short-range and tensor correlations[1]. Experimentally, the information about the nuclear spectral function in nuclear systems can be extracted from the electron- and/or proton-induced knockout reactions. Theoretically, the nuclear shortrange correlations and the spectral function in nuclear matter have been investigated extensively using various microscopic nuclear many-body approaches.

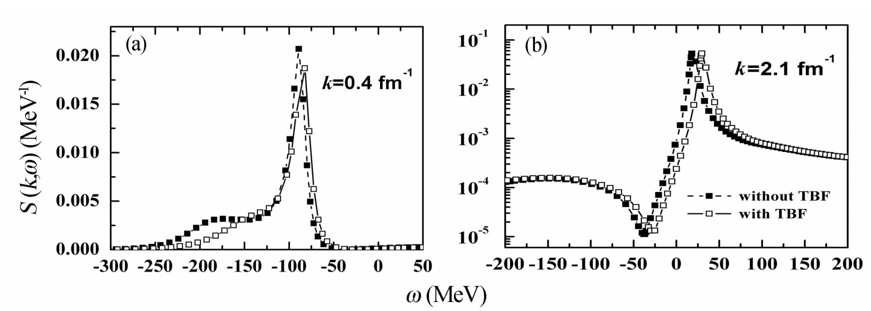

Fig. 1 Spectral function $S(k,\omega)$ at density of 0.34 fm^{-3}.

In the present work[2], we have investigated the off-shell mass operator and the nuclear spectral function in nuclear within the framework of the Brueckner theory extended to include a microscopic three-body force (TBF). Special attention has been paid on the TBF effect. The first two terms in the hole-line expansion of the mass operator have been taken into account in the present calculation. The dependence of the off-shell mass operator upon the momentum k and upon the nucleon frequency ω has been discussed. It is shown that the TBF effect on the values of $M_1(k,\omega)$ for a fixed momentum is only important at high densities or at frequencies far away from its on-shell energy at k_F. At large densities well above the saturation density, inclusion of the TBF may enhance the repulsion of V_2 at a large momentum above the corresponding Fermi momentum. The off-shell values of M_1 at fixed momenta has been compared with its on-shell values. For a fixed frequency, the k dependence of M_1 is investigated, and it turns out to be necessary to take into account the TBF effect for getting a more exact k dependence of the mean field $M_1(k,\omega)$ felt by a nucleon with both low momentum and large frequency. The TBF effect on the nucleon spectral function has been calculated and the results are given in Fig. 1 where the spectral function is plotted versus ω at density of 0.34 fm^{-3}. The upper part of the figure displays the spectral distribution for a momentum below the Fermi momentum; the lower part of the figure shows the spectral distribution for a momentum above k_F. At density of $\rho=0.34$ fm^{-3} well above the saturation density, the TBF effect shifts the peak location in the spectral function to slightly higher energy and reduces slightly the peak value at low momentum below the Fermi momentum k_F. The TBF effect on the nucleon spectral function turns out to be neglected at the saturation density $\rho=0.17$ fm^{-3}. It becomes sizable only at high densities well above the saturation density.

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1 - 3 Three-body Force Effect on Nucleon Momentum Distributions in Asymmetric Nuclear Matter within Framework of Extended BHF Approach

Zuo Wei, Yin Peng, Li Jianyang and Wang Pei

In nuclear medium, nuclear many-body correlations, especially the short-range correlations, may lead to the depletion of the nucleon momentum distribution below the Fermi momentum and the population above the Fermi momentum in nuclear matter[1]. The depletion of the Fermi sea is expected to be closely related to the hard core and the tensor component of the nucleon-nucleon (NN) interaction[2]. It plays an important role in testing the validity of the physical picture of independent particle motion in the mean field theory or the standard shell model and serves as a measure of the strength of the dynamical NN correlations induced by the NN interaction in a nuclear many-body system[3]. The study of the nucleon momentum distribution in nuclear matter may provide desirable information on the depletion of the deeply bound states inside finite nuclei and is expected to be important for understanding the structure of finite nuclei.

In the present work[4], we have calculated the TBF effect on the proton and neutron momentum distributions in asymmetric nuclear matter within the framework of the extended Brueckner-Hartree-Fock approach by adopting the AV18 two-body interaction supplemented with a microscopic three-body force (TBF). In symmetric nuclear matter, the obtained depletion of the hole states deep inside the Fermi sea is roughly 15% at the empirical saturation density. In asymmetric nuclear matter, the neutron and proton momentum distributions turn out to become different and may split with respect to their common distribution in symmetric nuclear matter. Increasing the isospin asymmetry β tends to enhance the depletion of the proton Fermi sea while it reduces the depletion of the neutron Fermi sea, which is in good agreement with the recent prediction in Ref. [5] within the framework of the Green function method. Our result implies that at a higher asymmetry the effect of the tensor correlations induced by the NN interaction may become stronger on protons while it gets weaker on neutrons. Fig. 1 displays the proton and neutron momentum distributions at zero momentum $k=0$ as functions of the isospin-asymmetry β in the two cases with (solid curves) and without (dashed curves) including the TBF. At zero momentum, the neutron occupation