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Some Aspects of Nuclear Structure in Relativistic Approach

MA Zhong-Yu,[1] RONG Jian,[1] CAO Li-Gang,[2] CHEN Bao-Qiu,[1] and LIU Ling[3]

[1] China Institute of Atomic Energy, Beijing 102413, China
[2] Institute of High Energy Physics, the Chinese Academy of Sciences, Beijing 100039, China
[3] Department of Physics, Beijing Normal University, Beijing 100875, China
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Abstract: The nucleon effective interaction in the nuclear medium is investigated in the framework of the Dirac-Brueckner-Hartree-Fock (DBHF) approach. A new decomposition of the Dirac structure of nucleon self-energy in the DBHF is adopted for asymmetric nuclear matter. The properties of finite nuclei are investigated with the nucleon effective interaction. The agreement with the experimental data is satisfactory. The relativistic microscopic optical potential in asymmetric nuclear matter is investigated in the DBHF approach. The proton scattering from nuclei is calculated and compared with the experimental data. A proper treatment of the resonant continuum for exotic nuclei is studied. The width effect of the resonant continuum on the pairing correlation is discussed. The quasiparticle relativistic random phase approximation based on the relativistic mean-field ground state in the response function formalism is also addressed.

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