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Fermi liquid theory and Kuo-Brown effective interactions JEREMY W. HOLT, G.E. BROWN, J.D. HOLT, T.T.S. KUO, SUNY, Stony Brook, S.K. BOGNER, The Ohio State University — We study the properties of nuclear matter using the low-momentum nucleon-nucleon interaction $V_{\mathrm{low-k}}$ and Landau's theory of normal Fermi liquids. The Landau f-function, which describes the quasiparticle-quasihole interaction at the Fermi surface, can be expanded in Legendre polynomials whose coefficients are directly related to the effective mass, symmetry energy, and compression modulus of nuclear matter. It is found that in the single-bubble approximation to the induced interaction of Babu and Brown, the compression modulus is much too repulsive compared with experiment. This is remedied by solving the Babu-Brown equation self-consistently using $V_{\mathrm{low-k}}$ as the driving term. The result is a reasonable agreement with experiment, both for the compression modulus and the remaining Fermi liquid parameters. In addition, we discuss the effect of high-order direct and exchange terms in the quasiparticle scattering amplitude.

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