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The nuclear matter effect on the NN-amplitude of scattering from analysis of nuclear scattering data

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Abstract. The nucleus-nucleus microscopic optical potential (OP), defined by the nucleon-nucleon (NN) scattering amplitude and by density distributions of the interaction nuclei, is applied to construct the nucleus-nucleus differential cross-sections of elastic and inelastic scatterings. The respective experimental data of ^{4}He + ^{12}C and ^{12}C + ^{12}C at energies up to 1620 MeV are analyzed and the in-medium parameters of the NN-amplitude of scattering are established and compared with those from the scattering using free nucleons. In addition, our best-fit in-medium parameters σ, α, β are consistent with other works.