

MEDIUM EFFECT OVER NORMAL DENSITY PROBED BY NUCLEUS-NUCLEUS ELASTIC SCATTERING

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Recently, we proposed the model to investigate the nuclear matter properties in the high-density region over the normal density. The model is based on the double-folding (DF) model through the frozen density approximation (FDA). The FDA is applied to the local density, which is the density evaluated by density-dependent nucleon-nucleon (NN) interaction, in most of the DF models. It is assumed for the FDA approach that the form of the projectile and target nuclei remains during the nuclear collision. By this assumption, the local density for the nucleus-nucleus system can exceed the normal density.

We test the role of the medium effect in high local-density region of the colliding nucleus-nucleus system over the normal density based on the FDA, by artificially switching-off the medium effect for densities above a certain limit value over the normal density and examine its effect on the nucleus-nucleus potential and elastic-scattering cross sections. The effect of the three-body force (TBF) in the high-density region, particularly its repulsive component, is also investigated by artificially switching on and off the TBF and we found its crucial role in the high-density region above the normal density.