**General behavior of the effective nucleon-nucleon interaction as a function of the relative velocity.***

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Volume integrals of the central part of optical potentials extracted from data analyses for a variety of light and heavy systems have been studied. The data-extracted integrals present a quite simple behavior as a function of the relative velocity between target and projectile. This behavior is system-independent and, therefore, it reflects a feature of the effective nucleon-nucleon interaction itself. The overall results are in excellent agreement with the predictions of the non-local and parameter-free Sao Paulo potential. The dependence of these integrals on the relative velocity is compatible with the prediction of the Sao Paulo potential up to $0.7c$ and the present findings indicate that the model probably could be successfully applied also in elastic scattering data analyses for much lighter systems.

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