

Abstract Submitted  
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**Constraining in-medium nucleon-nucleon interactions via nucleus-nucleus reactions**<sup>1</sup> FRANCESCA SAMMARRUCA, LARZ WHITE, University of Idaho — The nuclear equation of state is a broadly useful tool. Besides being the main input of stellar structure calculations, it allows a direct connection to the physics of nuclei. For instance, an energy functional (such as a mass formula), together with the energy/particle in nuclear matter, can be used to predict nuclear energies and radii [1]. The single-particle properties are also a key point to link infinite nuclear matter and actual nuclei. The parameters of the single-particle potential, in particular the effective mass, enter the calculations of, for instance, in-medium effective cross sections. From the well-known Glauber reaction theory, the total nucleus-nucleus reaction cross section is expressed in terms of the nuclear transparency, which, in turn, depends on the overlap of the nuclear density distributions and the elementary nucleon-nucleon (NN) cross sections. We explore the sensitivity of the reaction calculation to medium modifications of the NN cross sections to estimate the likelihood of constraining the latter through nuclear reactions. Ultimately, we wish to incorporate isospin asymmetry in the reaction model, having in mind connections with rare isotopes. [1] F. Sammarruca, arXiv:1002.00146 [nucl-th]; International Journal of Modern Physics, in press.

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