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Equation of state of nuclear matter from collective flows in intermediate energy heavy-ion collisions: an update

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The equation of state of nuclear matter, momentum dependence of the optical potential and in-medium modification of elastic nucleon-nucleon cross-sections have been previously studied by comparing theoretical predictions for collective flows and stopping observables in intermediate energy heavy-ion collisions to experimental data gathered by the FOPI Collaboration [1]. The study is extended to include experimental data for neutron-to-hydrogen [2] and neutron-to-charged particles flow ratios [3]. The impact on sensitivity of neutron skins, threshold effects and isospin asymmetry dependence of in-medium elastic nucleon-nucleon cross-sections is presented in detail. Nucleonic observables (stopping, directed and elliptic flows) measured recently by the S π RIT Collaboration [4] are also added to the analysis and a comparison with existing studies is discussed.

1. M.D. Cozma, arXiv:2407.16411;
2. P. Russotto et al., Phys. Lett. B 697, 471 (2011);
3. P. Russotto et al., Phys. Rev. C 94, 034608 (2016);
4. C.Y. Tsang et al., Phys. Lett. B 853, 138661 (2024).

Primary author: COZMA, Dan (IFIN-HH)

Presenter: COZMA, Dan (IFIN-HH)

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