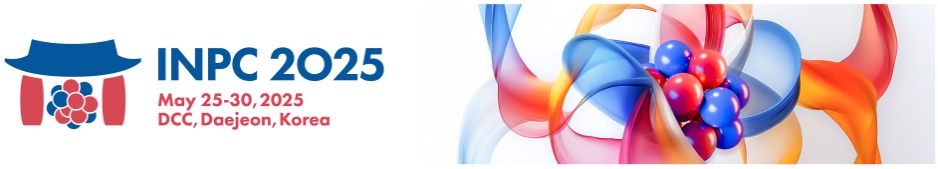

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Directed and elliptic flow parameters in 129,124Xe + 124,112Sn collisions at 100 MeV/u and 58,64Ni + 58,64Ni at 52 MeV/u

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The symmetry energy is the term that depends on the neutron-proton asymmetry in nuclear equation of state of nuclei and nuclear matter. It is a critical parameter to understand not only the basic properties of nuclear matter, but also the stability of the neutron stars in the Universe. Over the last several decades, nuclear symmetry energy has been studied by comparing the experimental data from heavy-ion collisions with the model calculations. However, the conclusion has not yet been reached as many aspects remain unknown.

To shed some lights on the symmetry energy as well as the equation of state the INDRA and ALADIN Collaborations jointly performed the experiment on Xe + Sn collisions at around 100 MeV/u at GSI in Germany in 1998. In addition, more recently, the INDRA-FAZIA Collaboration obtained the Ni + Ni collision data at 52 MeV/u in 2019. Both studies utilized several isotopic combinations for the beam and target to explore potential isospin dependencies.

In this presentation, we summarize the analysis status of the flow parameters in 129,124Xe + 124,112Sn collisions at 100 MeV/u and 58,64Ni + 58,64Ni at 52 MeV/u. The observables include the directed-flow parameter in the reaction plane and the elliptic-flow parameter in the transversal plane for the various combination of the isotopes for the beam and target. Finally, the experimental data are compared with the theoretical calculations from the ImQMD model to draw any physics conclusions.

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