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The symmetry energy at suprasaturation density and the ASY-EOS experiment at GSI:

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The Symmetry Energy is a fundamental ingredient of the nuclear matter Equation Of State. The elliptic-flow ratio of neutrons with respect to protons or light complex particles in reactions of heavy-ions at pre-relativistic energies has been proposed as an observable sensitive to the strength of the Symmetry Energy at supra-saturation densities.

The results obtained from the existing FOPI/LAND data for Au+Au collisions at 400 MeV/nucleon in comparison with the UrQMD model indicate a moderately soft symmetry energy but suffer from a considerable statistical uncertainty [1]; these results were confirmed by an independent analysis based on Tübingen QMD [2].

A new experiment, carried out at the GSI laboratory by the ASY-EOS collaboration [3], has given a more stringent constraint for the nuclear symmetry energy at supra-saturation densities. Moreover, future plans for extending these studies at higher densities, also by using Radioactive Ion Beams, will be discussed. Talk presented on behalf of the ASY-EOS and NewCHIM collaborations

[1] P. Russotto et al., Phys. Lett. B 697 (2011) 471.

[2] M.D. Cozma, Phys. Lett. B 700, 139 (2011); M.D. Cozma et al., Phys. Rev. C 88, 044912 (2013).

[3] P. Russotto et al., Eur. Phys. J A 50, 38 (2014); P. Russotto et al., submitted to Phys. Rev. C (2016).

Summary

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