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Processes of hypernuclei formation in relativistic ion collisions

Thursday 13 July 2017 09:00 (20 minutes)

The study of hypernuclei in relativistic ion collisions open new opportunities for nuclear and particle physics. The main processes leading to the production of hypernuclei in these reactions are (1) the disintegration of large excited hyper-residues (target- and projectile-like), and (2) the coalescence of hyperons with other baryons into light clusters. We use the transport, coalescence and statistical models to describe the whole process, and demonstrate the advantages over the traditional hypernuclear methods: A broad distribution of predicted hypernuclei in masses and isospin allows for investigating properties of exotic hypernuclei, as well as the hypermatter both at high and low temperatures.
We point at the abundant production of multi-strange nuclei and new bound/unbound hypernuclear states. The realistic estimates of hypernuclei yields in various collisions are presented [1].
Other processes well known in normal reactions: evaporation, fission, multifragmentation break-up are calculated in the case of hypermatter [2]. There is a saturation of the hypernuclei production at high energies [1], therefore, the optimal way to pursue this experimental research is to use the accelerator facilities of intermediate energies, like FAIR (Darmstadt) and NICA (Dubna).

[1] A.S. Botvina, et al., Phys. Rev. C95, 014902 (2017).

[2] A.S. Botvina, et al., Phys. Rev. C94, 054615 (2016).

List of tracks

Strangeness production at low baryon densities

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