Formation of hypernuclei in relativistic ion collisions

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The production of hypernuclei in relativistic ion collisions, that is adequate to future experiments at heavy-ion facilities, is under study. Within the hybrid approach we use transport, coalescence and statistical models to describe the whole process [1–3]. We demonstrate that the origin of hypernuclei can be explained by typical baryon interactions, that is similar to the production of conventional nuclei. In particular, heavy hypernuclei are coming mostly from projectile and target residues, whereas light hypernuclei can be produced at all rapidities. The yields of hypernuclei increase considerably above the energy threshold for the Lambda-hyperon production, and there is a tendency to saturation of yields of hypernuclei with increasing the beam energy up to few TeV. There are unique opportunities in relativistic ion collisions which are difficult to realize in traditional hypernuclear experiments: The produced hypernuclei have a broad distribution in masses and isospin [3,4]. They can even reach beyond the neutron and proton drip-lines and that opens a chance to investigate properties of exotic hypernuclei. One finds also the abundant production of multi-strange nuclei, of bound and unbound hypernuclear states with new decay modes. In addition, we can directly get an information on the hypermatter both at high and low temperatures. We demonstrate the comparison of our calculations with the first available experimental data.

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