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Perspectives on (multi-strange) hypernuclei physics with the CBM experiment at FAIR

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The main goal of the CBM experiment at FAIR is to study the properties of nuclear matter at very high baryonic density, where an onset of the transition to a deconfined and chirally restored phase is expected to happen. The study of (multi-strange) hypernuclei production mechanism in high baryon density region of QCD phase diagram, determination of their lifetimes, decay branching ratios and binding energy will provide information on the hyperon-nucleon and hyperon-hyperon interactions, which are essential ingredients for the understanding of the nuclear matter equation-of-state at high densities, and, hence, of the structure of neutron stars.

The CBM detector is designed to measure such rare diagnostic probes with unprecedented precision and statistics. Independent of the production mechanism, theoretical models predict that single and double hypernuclei, and heavy multi-strange short-lived objects are produced in heavy-ion collisions with the maximum yield at FAIR energies. Results of feasibility studies of single and double hypernuclei and hyperon-hyperon interaction from femtoscopic studies in the CBM experiment are discussed.

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