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Production and properties of hypernuclei with ALICE

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Hypernuclei are bound states of nucleons and hyperons. The measurement of the production of hypernuclei with mass number A=3 and 4 in heavy-ion collisions is a powerful tool to investigate the hypernucleosynthesis mechanism. In the coalescence model, the production yields are sensitive to the interplay between the spatial extension of the nucleus wavefunction and the baryon-emitting source size, whereas, in the statistical hadronization model, the nuclear structure does not come into play in the production. Hypernuclei span over a wide range of wavefunction radii, from about 2 fm for A=4 hypernuclei to about 10 fm for the hypertriton, making them ideal probes to test such models. In addition, the study of hypernuclei properties provides information on the nucleon-hyperon interactions, complementing the results obtained through femtoscopy correlation measurements. The strength of such interactions is a fundamental input to calculate the equation-of-state of the high-density nuclear matter found inside neutron stars. This contribution presents recent measurements of 3ΛH, 4ΛH, and 4ΛHe based on the data samples collected by ALICE during the LHC Run 2 and Run 3. The results are compared with expectations from state-of-the-art models on production through coalescence and thermal production.

Secondary track

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