

Measurement of the hypertriton lifetime and production at the LHC

Wednesday, 29 June 2022 18:20 (15 minutes)

The measurement of the production and the lifetime of the hypertriton with the ALICE detector at the LHC is presented to address some of the key open questions of hypernuclear and particle physics.

The hypertriton is a bound state of a proton (p), a neutron (n) and a Λ and it is characterized by a very low binding energy and a large wave function. It is still unclear how such a fragile object can survive the extreme environment created in ultrarelativistic heavy-ion collisions and the measurement of the production yields in Pb-Pb collisions can shed light on the production mechanism of such a system.

The study of the hypertriton characteristics also provides insights into the strong interaction between the lambda and ordinary nucleons and when studied in small colliding systems, like pp and p-Pb collisions, the hypertriton can give useful constraints for the nucleosynthesis models.

Thanks to the very large dataset collected so far in pp, p-Pb and Pb-Pb collisions, the ALICE collaboration has performed systematic and precise measurements of the hypertriton production, lifetime and binding energy, thus also contributing to solving the longstanding hypertriton lifetime puzzle.

In this contribution, an overview of those results will be presented and compared with the existing theoretical predictions.

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Session Classification: 3; Wed-IVb