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Observation of antihelium and antihypertriton in pp collisions with LHCb

Wednesday 23 August 2023 16:50 (15 minutes)

The first observation of hypertriton and antihypertriton at the LHCb experiment is reported. The used dataset consists of pp collisions at $\sqrt{s} = 13$ TeV, collected between 2016 and 2018, and corresponds to an integrated luminosity of L = 5.5/fb. The hypertriton candidates are reconstructed via the 2-body decay into helium-3 and a charged pion. The corresponding helium nuclei are identified with a technique, innovative at the LHCb experiment, using ionization losses in the LHCb VELO and ST silicon sensors and timing information in the LHCb OT drift tubes. A total of 10^5 prompt helium and antihelium are identified with negligible background contamination and 10^2 hypertriton candidates are found, allowing for a rich program of precise measurements of QCD and astrophysical interest to be performed on the available data.

Collaboration / Activity

LHCb

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