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Differential measurement of the common particle emitting source using p–p and p–Λ correlations in pp collisions at 13.6 TeV with ALICE

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Using data collected in high-multiplicity pp collisions at 13 TeV with the ALICE detector during the Run 2 period of the LHC, the femtoscopy technique has been successfully employed to extend the boundaries of known hadron-hadron interactions to the S=-3 sector and to initiate studies of charmed and three-body systems. The key element of these analyzes is the precise modeling of the common particle-emitting source, whose size was found to scale with the average transverse mass m_{T} of the studied particle pair. During the ongoing Run 3 data-taking period, the ALICE experiment collected the largest minimum bias dataset in its history, consisting of about 500 billion events at 13.6 TeV. This provides for the first time the opportunity to additionally investigate the common source as a function of event multiplicity.
In this contribution, the measurement of the size of the common particle-emitting source from p–p and p–Λ pair correlations as a function of event multiplicity and m_{T} of the particle pairs are presented. This is achieved by modeling the final-state interaction of p–p pairs with realistic potentials anchored to scattering data, whereas the p–Λ interaction is modeled using state-of-the-art EFT calculations. The presented results will be the basis for all further femtoscopic studies with ALICE in Run 3.

Auteur principal: RIEDEL, Anton (Technical University of Munich)

Co-auteur: ALICE, Collaboration

Orateur: RIEDEL, Anton (Technical University of Munich)

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