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Particle production of charged and light flavor hadrons, π , K , ϕ , p and Ξ , as a function of Transverse Sphericity in pp collisions $\sqrt{(s)} = 13$ TeV with ALICE at the LHC

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The underlying mechanisms of light flavour production are currently not well understood, although they can be described in the framework of different phenomenological models. pQCD models based on hard scatterings, such as PYTHIA, describe light flavour production via string-breakings and rope-hadronization. Statistical thermal models predict that the production of light flavour particles is driven by extensive quantities (i.e temperature) and by the hadron masses. The results presented here aim to isolate the different components of hadron production via a differential analysis based on the transverse sphericity using data collected with the ALICE detector at the LHC. The transverse sphericity allows one to perform a topological selection of events that are “isotropic” (dominated by multiple soft processes) and “jetty” (where a single hard process is responsible for a significant part of the multiplicity).

In this contribution we present a study of inclusive charged-particle production, as well as identified π , K , ϕ , p , and Ξ particle production as a function of charged-particle multiplicity density and transverse sphericity at mid-rapidity, $|\eta| < 0.8$, in pp collisions at $\sqrt{(s)} = 13$ TeV. The results are presented for two multiplicity estimators covering different pseudorapidity regions. The focus of the inclusive charged-particle measurements is average p_T as a function of multiplicity and transverse sphericity. For identified hadrons, transverse momentum spectra and ratios will be presented for high multiplicity events for both estimators.

Finally, the results obtained with ALICE are compared to different model calculations.

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