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Production of identified light flavour hadrons as a function of underlying event activity in pp collisions with the ALICE detector

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Various recent measurements of high-multiplicity pp and p-A collisions at LHC energies have revealed, surprisingly, that these small collision systems exhibit some features of the quark-gluon-plasma, e.g. collective behaviour and strangeness enhancement, formerly thought to be achievable only in heavy-ion collisions. A promising method to narrow down the origin of this behaviour is to study the effect of Multi-Parton Interactions (MPIs). As proposed in: “Probing collective effects in hadronisation with the extremes of the underlying event” by T. Martin, P. Skands, and S. Farrington (Eur. Phys. J. C (2016) 76, 299), the mean number of MPIs can be accessed experimentally through the self-normalised charged particle density in the Transverse region where the Underlying Event (UE) dominates: $R_T = N_{\text{Ch, Transverse}} / \langle N_{\text{Ch, Transverse}} \rangle$.

The study of particle production as a function of R_T would reveal whether, e.g., the properties of “low-UE” events ($R_T \rightarrow 0$) are compatible with equivalent measurements in e^+e^- collisions (jet universality) and whether the scaling behaviour towards “high-UE” ($R_T \rightarrow 1$) events exhibits properties of non-trivial soft-QCD dynamics.

In this contribution, the p_T spectra of π , K, p, ϕ and Ξ as function of R_T are presented in pp collisions at $\sqrt{s} = 13$ TeV. Moreover, the p_T -differential particle ratios as function of R_T in the Towards (jet region) and Transverse regions are contrasted. This discussion will be complemented with UE measurements at the same collision energy.

Primary author: VAZQUEZ RUEDA FOR THE ALICE COLLABORATION, Omar (Lund University (SE))

Presenter: VAZQUEZ RUEDA FOR THE ALICE COLLABORATION, Omar (Lund University (SE))

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