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Multiplicity Dependence of the K/π Ratio in e^+e^- Collisions with Archived DELPHI Data

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Strangeness enhancement has emerged as a system-spanning trend in pp, pPb, and PbPb collisions. Whether a similar behavior is present in elementary e^+e^- collisions, where the initial state is clean and final-state interactions are minimal, is a key question for disentangling hadronization dynamics from hot-QCD effects. We present a measurement of the kaon-to-pion yield ratio, K^\pm/π^\pm , as a function of the event charged-particle multiplicity using archived DELPHI data collected at LEP. Events are binned in the reconstructed track multiplicity $N_{\text{trk}}^{\text{offline}}$, and inclusive K^\pm and π^\pm yields are extracted using DELPHI's particle-identification capabilities, with corrections applied for detector acceptance and efficiency. The resulting K/π vs. $N_{\text{trk}}^{\text{offline}}$ dependence is compared to event generators such as PYTHIA6, PYTHIA8, HERWIG, and SHERPA. This measurement sheds new light on the emergence of strangeness enhancement in small collision systems.

Authors: Ms CHEN, Yi (Luna) (Vanderbilt University); E+E- ALLIANCE

Presenter: Ms CHEN, Yi (Luna) (Vanderbilt University)

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