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# Event-by-event dynamical fluctuations of $K/\pi$ , $p/\pi$ , and $K/p$ in Pb-Pb collisions with ALICE

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The study of event-by-event fluctuations of identified hadrons may reveal the degrees of freedom of the strongly interacting matter created in heavy-ion collisions and reflect the underlying dynamics of the system. The observable  $v_{\text{dyn}}$ , which is given in terms of the moments of identified-particle multiplicity distributions, is used to quantify the magnitude of the dynamical fluctuations in event-by-event measurements of given particle ratios. The ALICE detector at the LHC is well suited for the study of  $v_{\text{dyn}}$ , due to its excellent particle identification capabilities.

Particle identification that is based on the measurement of the specific ionization energy loss  $dE/dx$  works well on a statistical basis, however, suffers from ambiguities when applied on the event-by-event level. A novel experimental technique called the “Identity Method” was recently proposed to overcome such limitations. The method follows a probabilistic approach using the inclusive  $dE/dx$  distributions measured in the ALICE TPC, and determines the moments of the multiplicity distributions by an unfolding procedure. In this contribution, we will present dynamical  $K/\pi$ ,  $p/\pi$ , and  $K/p$  fluctuation analysis, which applies the Identity Method to Pb-Pb data from ALICE. We will also show comparisons to some theoretical models and the lower energy measurements at CERN-SPS and RHIC.

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