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Study of neutral and charged pions fluctuations with ALICE experiment

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Fluctuations of relative yield of neutral and charged pions are expected to be sensitive to the creation of quark-gluon matter, pion Bose-condensate or chiral phase transition, which may take place in AA, pA or even pp collisions. Quantitatively, such fluctuations can be estimated using the variable ν_{dyn} which, by its construction, reduces or completely removed most of the collisional bias, such as impact parameter fluctuations or fluctuations from the finite number of particles within the detector acceptance. In this report we will present the results of the analysis of fluctuations of charged and neutral pions using the dynamic variable ν_{dyn} in Monte-Carlo simulation of pp, pA and AA collisions at an energy of 5.02 TeV in the ALICE experiment. We will demonstrate that photons measured in the PHOS calorimeter do reproduce fluctuations of parent pions after correcting for the probability of registering one or two decay photons. We will discuss contributions of resonance decays and ways to reduce related contribution to ν_{dyn}. Possible relations to recent ALICE results on charged and neutral kaon fluctuations in Pb-Pb collisions will be addressed.

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