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Fluctuations of identified particle numbers in partial chemical equilibrium

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First six cumulants of proton number are calculated in the statistical resonance gas model with chemical potentials for every stable identified hadron species. The chemical potentials are chosen in such a way that the average particle numbers after decay of resonances are kept constant independently of temperature and equal to the values given at the chemical freeze-out. This corresponds to a fireball with hadron abundances set at the chemical freeze-out, which further cools down to the thermal freeze-out. It is shown that also the volume-independent ratios of cumulants stay nearly constant in such a scenario. This is useful information, because it shows that the observed non-critical values of volume independent cumulant ratios, which could be modified at any time during the fireball evolution, are not too much influenced after chemical freeze-out.

Primary authors: TOMASIK, Boris (Univerzita Mateja Bela (SK)); HILLMANN, Paula (Institut für theoretische Physik, Goethe-Universität Frankfurt); BLEICHER, Marcus (Uni Frankfurt)

Presenter: TOMASIK, Boris (Univerzita Mateja Bela (SK))

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