Universality of Hadronization Condition at RHIC and LHC
MICHAL PETRAN, JOHANN RAFELSKI, University of Arizona — The hadronization analysis within non-equilibrium SHM has shown that across RHIC and LHC energy range, and across a wide range of centrality we find a universal intensive hadronization conditions of the particle source: pressure $P_h \simeq 80\text{MeV/fm}^3$, energy density $\varepsilon_h \simeq 0.5\text{GeV/fm}^3$ and entropy density $\sigma_h \simeq 3.3\text{fm}^{-3}$. The parameters varying as a function of reaction energy and/or centrality are source volume $dV/dy$ and strangeness saturation $\gamma_s$. This discovery allows to simplify the SHM approach: the principle of Universal Hadronization reduces the number of parameters within the non-equilibrium SHM. Two suffice at LHC and three are enough at RHIC to fully characterize all hadron production. We show this using the SHARE program: we prescribe the intensive properties of the fireball, and fit at LHC $dV/dy$, $\gamma_s$ as a function of centrality, while at RHIC we must also introduce baryon–antibaryon asymmetry $\mu_B$, where $\mu_S$ is fixed by $<s> = <\bar{s}>$. The other SHM parameters e.g. $T$, $\gamma_q$, are an output of this procedure, which works for all hadrons. The convergence for the most central collisions of $s/S \rightarrow 0.03$ confirms strangeness chemical equilibration in the deconfined QGP fireball hadron source.

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