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Phenomenology of Identified Particle Spectra in Heavy-Ion Collisions at LHC Energies

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The Zubarev approach of the non-equilibrium statistical operator [1] is used to account for the enhancement of the low- p_T part of pion spectra by introducing an effective pion chemical potential [2]. This is an alternative to the explanation of the low- p_T enhancement by resonance decays. We report on first results obtained with a newly developed thermal particle generator that implements both mechanisms of low- p_T enhancement and applies Bayesian inference methods for these scenarios to find the most probable sets of thermodynamic parameters at the freeze-out hypersurface for the case of the transverse momentum spectra of identified particles measured by the ALICE Collaboration [3]. The Bayes factor is determined for these scenarios. The advantages and limitations of the Zubarev approach are discussed.

References:

- [1] D.N. Zubarev, V.G. Morozov and G. Röpke, Statistical Mechanics of Nonequilibrium Processes, Akademie Verlag Berlin (1996), vol. I
- [2] D. Blaschke et al., Particles 3, 380–393 (2020)
- [3] B. Abelev et al., Phys. Rev. C 88, 044910 (2013)

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