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The K*/K ratio in heavy ion collisions

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In this talk I will give a brief introduction about myself as a new PhD student starting to work with Monte Carlo event generators, more specifically, SHERPA. I will also present the main results obtained during my masters' when I studied the K/*K ratio in heavy ion collisions. The goal of this project was to understand the supression of this ratio during the hadron gas phase that the collision system undergoes after the hadronization of the quark gluon plasma. Given that the lifetime of the K* meson is shorter than that of the hadron gas itself, it's expected that the daughter particles of the K*decay will rescatter during this phase and, as a result, the observed K*/K ratio will be supressed when compared with predictions by statistical hadronization models. To take into account these hadronic interactions, we solve a system of differential equations for the abundances of K*and K mesons and compute the value of the K*/K ratio at the moment of thermal freeze-out, i.e., when the hadronic interactions cease. We explored how this solution was affected by different factors: the temperature evolution of the system, the kinetic freeze-out temperature and the interaction mechanisms for the K*and K mesons with the constituents of the gas. This analysis showed that the experimental data observed for the K*/K ratio in different collision systems can be described using a Bjorken-like temperature evolution and considering that the thermal freeze-out temperature decreases with the size of the post-collision system. We also showed that the most relevant interaction mechanisms in the hadron gas are $K^* \to K\pi$ and $K\pi \to K^*$.

Primary author: LE ROUX, Chiara

Presenter: LE ROUX, Chiara

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