

STATISTICAL HADRONIZATION OF CHARM: FROM FAIR TO LHC

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Charmonium production is considered, since the original proposal more than 20 years ago about its suppression in a Quark-Gluon Plasma (QGP) [1], as an important probe to determine the degree of deconfinement reached in the fireball produced in ultra-relativistic nucleus-nucleus collisions. In recent publications [2] we have demonstrated that experimental data on J/ψ and ψ' production in nucleus-nucleus collisions at the SPS and RHIC energies can be well described within the statistical hadronization model proposed in [3].

In this contribution we demonstrate that regeneration of charmonia at the phase boundary provides a natural explanation of the maximum of $R_{AA}^{J/\psi}$ observed at RHIC energy by the PHENIX collaboration [4]. We will confront the model with other available experimental data and provide predictions for the LHC energy, where qualitatively new features of J/ψ production are expected and await validation by data in the coming years. In addition we present the results of an exploratory study [5] of charmonium and open charm production close to the charm production threshold ($\sqrt{s} \approx 6$ GeV), an energy domain which can be investigated in the CBM experiment at the future FAIR facility. Emphasis is placed on the identification of effects on charmed hadron production due to possible in-medium modifications of masses of hadrons with open charm.

References

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