Transverse momentum and transverse mass distributions of J/ψ produced in Pb-Pb and p-A interactions at the CERN SPS

A. B. Kurepin [a] (for NA50 Collaboration)

[a] *Institute for Nuclear Research RAS,*
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Transverse momentum and transverse mass distributions of J/ψ were obtained by the analysis of muon pairs produced in Pb-Pb collisions at 158 GeV per nucleon [1] and in p-A interactions at 400 GeV [2]. The results of previous experiment were also used [3]. It is assumed that this study could provide an additional information on the transition to Quark-Gluon plasma state of matter.

The mean p_T^2 values were plotted as a function of a geometrical length L of a path of J/ψ in nuclear matter. This dependence at different energies (158, 200 and 400 GeV) could be approximated by a linear function of L according to the formalism of the initial-state parton multiple scattering model. After rescaling to one energy 158 GeV all mean p_T^2 values are proportional to the L values.

The dependence of the inverse slope T_{eff} of the transverse mass distributions for different sets of J/ψ data (pA, SU and Pb-Pb) on the energy density (ϵ) was also investigated. For all collision systems a linear behaviour is observed with almost the same initial value of T_{eff} at ϵ=0. Rescaled to 158 GeV energy all T_{eff} data are proportional to energy density. However for the most central Pb-Pb collisions the change to more flat dependence could be seen.

References

[1] NA50 Collaboration, M.C.Abreu et al., Phys. Lett. **B 499** (2001) 85.
[2] NA50 Collaboration, to be published.
[3] NA38 Collaboration, M.C.Abreu et al., Phys. Lett. **B 423** (1998) 207.