

J/ ψ suppression in p-A and In-In collisions at 158 GeV/nucleon

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A high-statistics study of J/ ψ production in p-A and In-In collisions at 158 GeV/nucleon has been carried out by the NA60 Collaboration at the CERN SPS.

In p-A collisions, the J/ ψ production has been studied for the first time at the same energy of the previously taken nucleus-nucleus data (In-In by NA60 and Pb-Pb by NA50). We will present the first preliminary results on the cross section σ_{abs} for nuclear absorption, extracted by comparing the J/ ψ yield on seven different targets (Be, Al, Cu, In, W, Pb and U). This quantity has a fundamental role in defining, for nucleus-nucleus collisions, the fraction of the observed J/ ψ suppression due to cold nuclear matter effects.

We will also present results on the rapidity and transverse momentum distributions of the J/ ψ produced in p-A collisions. By comparing the transverse momentum distributions in p-A and In-In, we will extract the nuclear modification factor $R_{\text{AA}}(p_{\text{T}})$, that will be compared with results obtained at higher energy by PHENIX.

In nucleus-nucleus collisions, the azimuthal distributions of quarkonium, relative to the reaction plane, are expected to be sensitive to the various physics mechanisms at the basis of the anomalous suppression. We will show results on the azimuthal anisotropy of the J/ ψ in In-In collisions, showing the dependence of the Fourier coefficient v_2 on centrality and transverse momentum.

Finally, the already existing NA60 results on the anomalous J/ ψ suppression are based on a normalization procedure that makes use of the Drell-Yan yield. This approach will be complemented by a study of the absolute cross sections, providing in this way an alternative, independent normalization of the nucleus-nucleus yield with respect to p-A.