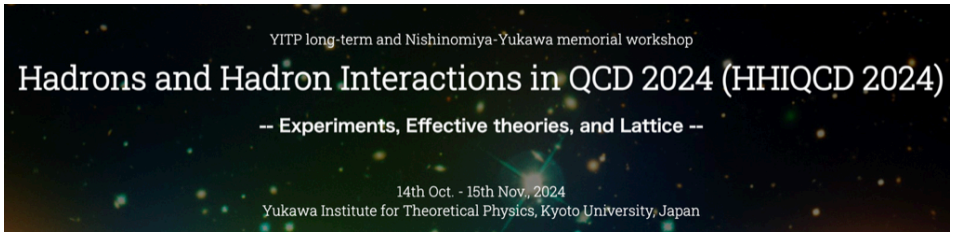

Contribution ID: **57** Type: **3rd week (Nishinomiya-Yukawa symposium)**

Emergence of New Systematics for Open Charm Production in High Energy Collisions

Tuesday, October 29, 2024 5:00 PM (30 minutes)

We show the production systematics of open charm hadron yields in high-energy collisions and their description based on the Statistical Hadronization Model. The rapidity density of D^0, D^+, D^{*+}, D_s^+ mesons and Λ_c^+ baryons in heavy ion and proton-proton collisions is analyzed for different collision energies and centralities. The Statistical Hadronization Model is extended to open charm production in minimum-bias and high-multiplicity pp collisions. In this context, we use the link between the rapidity density of open charm hadron yields, dN_i/dy, and the rapidity density of charm-anticharm quark pairs, $dN_{c\bar{c}}/d\eta$ to demonstrate that, in pp, pA and AA collisions, dN_i/dy scales in leading order with $dN_{c\bar{c}}/d\eta$ and the slope coefficient is quantified by the appropriate thermal density ratio calculated at the chiral crossover temperature, $T_c = 156.5$ MeV.

It is also shown that, in high energy collisions and within uncertainties, dN_i/dy exhibits a power law scaling with the charged-particle pseudo-rapidity density. Furthermore, presently available data on different ratios of open charm rapidity densities in high-energy collisions are independent of collision energy and system size, as expected in the Statistical Hadronization Model.

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