## HHIQCD2024



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  $\Lambda^+_c$  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.

Primary author: Prof. REDLICH, Krzysztof (University of Wroclaw)

**Co-authors:** Prof. STACHEL, Johanna (Uni. Heidelberg); Dr SHARMA, Natasha (Indian Institute of Science Education and Research (IISER) Berhampur); BRAUN-MUNZINGER, Peter

Presenter: Prof. REDLICH, Krzysztof (University of Wroclaw)

Session Classification: Nishinomiya-Yukawa workshop