Contribution ID: **17** Type: **not specified**

Open charm production in heavy-ion collisions at CERN SPS

The study of open charm hadron production provides an efficient tool for detailed investigation of the properties of hot and dense matter formed in relativistic nucleus-nucleus collisions. In particular, charm mesons are of vivid interest in the context of the phase transition between confined hadronic matter and the quark-gluon plasma as well as for the interpretation of data on J/ψ production measured by the NA38/NA50 and NA60 experiments. Also, such a study gives a unique opportunity to test the validity of theoretical models based on perturbative Quantum Chromodynamics and Statistical approaches for nucleus collisions at the top SPS energy. Such models provide predictions for charm yields that differ by up to two orders of magnitude.

The first measurements of open charm production were conducted using NA61/SHINE data from 2017 and 2018. However, only 95% CL limits on the yields could be established. During the CERN Long Shutdown 2, the detector underwent numerous upgrades, including the installation of a new high-acceptance vertex detector, crucial for the reconstruction of the short-lived open-charm hadrons. The new setup of the experiment is estimated to provide over a ten-fold increase in event statistics, allowing for a first conclusive measurement of charm production at the top SPS energy.

The contribution will introduce our approach to open-charm measurements, the results of our previous measurements, and the status of the ongoing analysis based on the newly acquired data.

Author: PIDHURSKYI, Ivan (Jan Kochanowski University (PL))

Presenter: PIDHURSKYI, Ivan (Jan Kochanowski University (PL))

Session Classification: HEAVY NUCLEI & COLLECTIVE PROPERTIES