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Open charm measurements in the NA61/SHINE experiment - status and plans

Wednesday, 16 May 2018 16:00 (20 minutes)

The measurement of open charm production was proposed as an important tool to
investigate the properties of hot and dense matter formed in nucleus-nucleus collisions as well as to provide the means for model independent interpretation of the existing data [1]. Recently, the experimental setup of the NA61/SHINE experiment was supplemented with a Vertex Detector (VD) which was motivated by the importance and the possibility of the first direct measurements of open charm meson production in heavy ion collisions at SPS energies.

First test data taken on December 2016 in Pb+Pb collisions at 150A GeV/c allowed to validate the general concept of D^0 meson detection via it's $D^0 \rightarrow \pi^+ + K^-$ decay channel and delivered a first indication of open charm production [2]. In October and November of 2017 large statistics data were recorded for Xe+La collisions at beam momenta of 150A and 75A GeV/c.
Minimum bias and 0-20\% centrality on-line trigger selection was applied. The Xe+La data are currently under intense analysis.

The talk will discuss the physics motivation of open charm measurements at SPS energies and provide an overview of existing heavy flavor measurements in this energy range. Finally, pilot results on open charm production will be presented
and future plans of open charm measurements in the NA61/SHINE experiment will be discussed requiring an upgraded version of the VD and speed-up of the TPC read-out.

[1] H. Satz {\it Adv. High Energy Phys.} {\bf 2013}, (2013) 242918.

[2] "Report from the NA61/SHINE experiment at the CERN SPS", CERN-SPSC-2017-038.

Content type

Experiment

Collaboration

NA61/SHINE

Centralised submission by Collaboration

Presenter name already specified

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