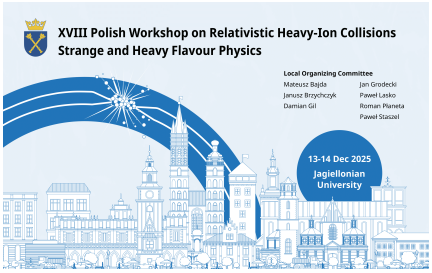

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Open charm measurements with the upgraded NA61/SHINE detector system

The NA61/SHINE experiment at the CERN Super Proton Synchrotron (SPS) investigates the properties of strongly interacting matter by studying hadron production in hadron–hadron, hadron–nucleus, and nucleus–nucleus collisions over a wide range of beam energies. One of the main goals of the program is to measure open charm production, which provides a sensitive probe of the medium produced in heavy ion collisions.

This contribution presents the current status of open charm measurements with the upgraded NA61/SHINE experimental setup. The talk will include an overview of the new high-resolution Vertex Detector and the experimental configuration used for open charm reconstruction. The reconstruction strategy for $D^0 \to K^-\pi^+$ and $\overline{D}^0 \to K^+\pi^-$ decays and the applied topological selection criteria will be discussed. Invariant mass distributions from Pb+Pb pilot data collected in 2022 will be presented, along with the motivation for introducing the segmented target system, which has been used since 2024, to reduce background and improve vertex separation. Finally, the prospects for upcoming Pb+Pb analyses will be outlined.

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