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First $D^0 + \overline{D^0}$ measurement in heavy-ion collisions at SPS energies with NA61/SHINE

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The measurement of open charm meson production provides a tool for the investigation of the properties of the hot and dense matter created in nucleus-nucleus collisions at relativistic energies. In particular, charm mesons are of vivid interest in the context of the study of the nature of the phase-transition between confined hadronic matter and the quark-gluon plasma. Recently, the experimental setup of the NA61/SHINE experiment was upgraded with the high spatial resolution Vertex Detector which enables the reconstruction of secondary vertices from open charm meson decays.

In this presentation the first D^0 meson yields at the SPS energy regime will be shown. The analysis used the most central 20% of Xe+La collisions at 150A GeV/c from the data set collected in 2017. This allowed the estimation of the corrected yields (dN/dy) for $D^0 + \overline{D^0}$ via its $\pi^{+/-} + K^{-/+}$ decay channel at mid-rapidity in the center-of-mass system. The results will be compared and discussed in the context of several model calculations including statistical and dynamical approaches.

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