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Lambda Polarization in Au+Au collisions at sqrt(s)_NN = 2.4 GeV measured with HADES

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To observe a possible vortical structure of the system created in relativistic heavy-ion collisions, the spin directions of produced particles with respect to the total angular momentum need to be measured. The Λ hyperon is a good candidate to look for a possible spin polarization. Due to the parity violation of the weak interaction, the daughter proton is predominantly emitted in the spin direction of the Λ. On the other hand the direction of the total angular momentum can be estimated from the event plane reconstructed from the spectators of the collision. Having all the informations one can calculate the percentage of vector polarization of the Λ.\\
In april 2012 the HADES experiment collected a high statistics sample of Au+Au collisions at $\sqrt{s_{NN}} = 2.4$ GeV. $7 \cdot 10^9$ minimum bias events have been recorded. Using the decay topology and combining measured proton and pion tracks to Λ candidates, this allows to clearly distinguish between signal and background. The use of the multi-variant analysis further improves this identification procedure significantly. Overall, $N_\Lambda \approx 2 \cdot 10^5$ Λs have been reconstructed in the 40 \% most central collisions.\\
In this contribution, preliminary results of the Λ polaritzation in Au+Au collisions at $\sqrt{s_{NN}} = 2.4$ GeV measured with HADES will be shown. They will be put in the context of the STAR measurements which show a non-zero polarization with an increasing trend towards lower beam energies. The lowest measurement at $\sqrt{s_{NN}} = 7.7$ GeV indicates a polarization of a few percent, so a mesurement at even lower beam energies will shed light onto the question whether this increase continues or the polarization vanishes again.

Collaboration name

HADES collaboration

Track

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