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Polarization measurements of Λ hyperons and K^{*0} vector mesons with ALICE at the LHC

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Polarization of hyperons and vector mesons in non-central heavy-ion collisions could occur due to the large initial angular momentum of the system or during the process of hadronization. Polarization studies of hyperons and vector mesons can give us information about the initial angular momentum in heavy-ion collisions. This phenomenon could create a non-uniform angular distribution of the decay products with respect to the quantization axis in the rest frame of the mother particle. This quantization axis can be the normal to the production plane (plane subtended by the momentum of the mother particle and the beam axis) or the normal to the reaction plane (defined by the impact parameter and the beam axis) of the system. This angular distribution can be used to estimate the polarization of Λ -baryons (PA) and the spin density matrix element p00 for vector mesons. A significant deviation of the value of PA from 0 or p00 from 1/3 would indicate the presence of polarization for hyperons and vector mesons, respectively.

We will present the first results from the polarization study of Λ hyperons and K⁰ vector mesons at mid-rapidity in Pb-Pbcollisions and (spin zero) mesons for which no polarization signal is expected.

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Session Classification: Hot and dense matter physics (QGP and heavy ion collision)

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