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Spin alignment measurements of vector mesons with ALICE at the LHC

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In the presence of the large initial angular momentum occurring in non-central heavy-ion collisions, vector mesons can be produced in a polarized state. This might be either due to spin-orbital-angular-momentum interaction or by hadronization from polarized quarks. Experimentally, vector meson polarization is measured from the angular distribution of the decay daughters with respect to a quantization axis. A significant deviation from a non-uniform angular distribution would indicate the presence of spin alignment. We will present recent measurements of spin alignment for $K^*(892)^0$ and ϕ(1020) mesons at midrapidity in Pb-Pb and pp collisions at the LHC with the ALICE detector. The results indicate presence of spin alignment of K* and ϕ vector mesons in Pb-Pb collisions with respect to the event plane, whereas no spin alignment is observed for the K0s scalar meson. In pp collisions, no spin alignment is observed also for the vector mesons, indicating that the phenomenon arises from heavy-ion phenomenology and it is qualitatively consistent with expectations from the effect of large initial angular momentum in non-central collisions.

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Secondary track (number)

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