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Exploring the magnetic field in heavy-ion collisions through spin alignment measurements at ALICE

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Spin alignment of vector mesons produced in non-central heavy-ion collisions could occur due to the large angular momentum and intense magnetic field expected in the initial stages of these collisions. Experimentally, vector meson polarization is observed from the angular distribution of the decay daughters with respect to a quantization axis. The study of the angular distribution of the decay products leads to a measurement of the zeroth element of the spin density matrix element ρ_{00} . Any deviation of the value of ρ_{00} from $1/3$ would indicate the presence of spin alignment. We report on recent measurements of spin alignment for $K^*(892)^0$ and $\phi(1020)$ mesons at midrapidity in Pb-Pb and pp collisions at the LHC with the ALICE detector. The transverse momentum, centrality and energy dependence of ρ_{00} will be shown. The results will be discussed together with those obtained for the K_s^0 scalar meson and obtained with respect to the random orientations of the production and event planes.

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