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Azimuthal anisotropy of heavy-flavour production with ALICE at the LHC

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Heavy quarks are sensitive probes to test the properties of the Quark-Gluon Plasma (QGP) state formed in heavy-ion collisions since, due to their large masses, they are formed on timescales shorter than the QGP formation time.

In particular, the measurement of the azimuthal anisotropy of hadrons containing heavy quarks gives insight into the participation of low-momentum heavy quarks in the collective expansion of the system and their possible thermalisation in the medium. Recent measurements of the azimuthal anisotropy in high-multiplicity pp and p-Pb collisions show remarkable similarities with Pb-Pb collisions and suggest the presence of collectivity, whose origin is still debated.

In addition, due to their formation time, heavy quarks are also ideal candidates to probe the strong magnetic field created in heavy-ion collisions by the charged nucleons of the colliding nuclei that do not participate in the collision. In this context, the measurement of the direct flow coefficient of D mesons will give access to fundamental properties of the QGP.

In this contribution, the latest measurements of heavy-flavour azimuthal anisotropies in Pb-Pb collisions and in p-Pb collisions at $\sqrt{s_{NN}} = 5.02$ TeV with ALICE will be presented. The D-meson azimuthal anisotropy measured with an Event-Shape Engineering technique will be also shown to investigate the influence of initial geometry fluctuations on heavy-flavour production.

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