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Directed, elliptic and triangular flow of D mesons in ALICE

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Heavy quarks (charm and beauty) are produced in abundance during the early stage of ultrarelativistic heavy-ion collisions. They therefore experience the full evolution of the quark-gluon plasma (QGP). This makes them unique probes of the initial conditions and of the collective behaviour of the medium as it expands and cools.

The elliptic flow (v_2) is an observable that reflects the initial geometry and the degree of collectivity in this expanding system. The directed flow (v_1) of heavy-flavour particles is sensitive to the unprecedentedly strong magnetic fields present in the early stages of the collision, and so measurements of its charge dependence are key to constraining the electrical conductivity of the QGP. Finally, the triangular flow (v_3) is driven by fluctuations in the initial state of the system, and is sensitive to the ratio of the shear viscosity to the entropy density, η/s .

This talk will present the latest measurements by the ALICE Collaboration on the directed, elliptic and triangular flow of charmed hadrons in Pb-Pb collisions at $\sqrt{s_{NN}} = 5.02$ TeV. The charge-dependent v_1 of D^0 mesons will be shown, as well as the average D-meson v_2 measured by standard and Event-Shape Engineering (ESE) techniques, and the non-strange D-meson v_3 . The non-strange D-meson v_2 results will also be compared with those of strange D mesons to study in addition the effects of quark recombination. Comparisons with predictions from theoretical models will be discussed.

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