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Measurements of D meson nuclear modification factors and of direct and elliptic flow of D0 mesons in pPb and PbPb collisions at 5.02 with CMS

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the study of charm production in heavy-ion collisions is considered an excellent probe to study the properties of the hot and dense medium created in heavy-ion collisions. Measurements of D- meson nuclear modification, elliptic and triangular flow in PbPb collisions can provide strong constraints into the mechanisms of in-medium energy loss and charm flow in the medium. The measurement of charm flow and, in particular, of the direct flow coefficient is also expected to be sensitive to the extremely strong but short-lived magnetic field induced by the spectator protons in non- central collisions. This strong magnetic field is indeed expected to generate differences in rapidity-odd directed flow for charm and anti-charm mesons, which can be measured with high precision with the CMS apparatus. In this talk, the measurements of the D^0 nuclear modification factor, of the elliptic and triangular flow measured by CMS in PbPb collisions at 5.02 TeV will be presented together with the a new measurement of D^0 R_{pPb} in pPb collisions at 5.02 TeV, which can provide more constrains into the relevance of cold nuclear matter effects at central rapidity down to very low tranverse momenta. The first measurement of the direct flow of charm and anti-charm in non-central collision will also be shown and compared to those for inclusive charged particles, previously measured by the CMS Collaboration.

Content type

Experiment

Collaboration

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