



Beitrag ID: 160

Typ: Talk

## Measurements of $D^0$ mesons production and collective flow with CMS at 5.02 TeV

Mittwoch, 29. März 2023 14:00 (20 Minuten)

The interaction of heavy quarks with the quark-gluon plasma (QGP) affects their azimuthal distribution and  $p_T$  spectrum, hence measurement of azimuthal anisotropy coefficients ( $v_n$ ) and nuclear modification factors ( $R_{AA}$ ) of heavy flavor hadrons turns out to be an important probe of the QGP. However, simultaneous modeling of  $v_n$  and  $R_{AA}$  is still challenging. This talk reports the first nonprompt  $D^0$  measurements of the azimuthal anisotropy elliptic ( $v_2$ ) and triangular ( $v_3$ ) coefficients in large systems, using  $\sqrt{s_{NN}} = 5.02$  TeV, collected with the CMS apparatus. The measurements are performed as a function of transverse momentum, spanning 1–30 GeV/c, in three centrality classes, from central to midcentral collisions. Compared to the prompt  $D^0$  results, the nonprompt  $D^0$   $v_2$  flow coefficients are systematically lower and show less dependence on  $p_T$  and centrality. An indication of non-zero  $v_3$  coefficient of the nonprompt  $D^0$  is observed. A wide  $p_T$  range enables the study of various flow generation mechanisms, like diffusion at low  $p_T$  and path-dependent parton energy loss at high  $p_T$ . In addition, measurements of both prompt and nonprompt  $D^0$  mesons cross sections in PbPb and pp collisions, as well as  $R_{AA}$ , will be shown. The results will be compared to theoretical predictions.

### Experiment/Theory

CMS

### Affiliation

CMS

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**Sitzung Einordnung:** Parallel: Heavy Flavours & Quarkonia

**Track Klassifizierung:** Heavy flavor and quarkonia