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## Measurements of heavy-flavor quark probes of the QGP with the ATLAS detector

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Open heavy-flavor hadron production, azimuthal anisotropy and correlations in heavy-ion collisions serve as powerful tools to study quark-gluon plasma (QGP) properties, heavy-flavor energy loss due to interaction with QGP, and heavy-flavor hadronization.

This talk presents recent ATLAS results on the azimuthal anisotropy ( $v_2$  and  $v_3$ ) and nuclear modification factor ( $R_{AA}$ ), separately for muons from charm and bottom hadrons, as well as di-muon azimuthal correlations and yields in Pb+Pb and  $pp$  collisions.

Muons from both charm and bottom hadrons are found to have significant non-zero, second- and third-order azimuthal anisotropies in Pb+Pb collisions, with larger anisotropies for muons from charm hadrons than for muons from bottom hadrons. We highlight that a precise measurement of  $v_3$  for bottom is presented.

Muons from both sources are also observed to be strongly suppressed with respect to the  $pp$  baseline, in a way that depends on the mass of the parent hadron at low to moderate muon  $p_T$ .

These studies can help to determine whether collisional or radiative processes dominate the energy loss of HF quarks as they traverse the QGP produced in heavy-ion collisions. In particular, the simultaneous measurement of multiple observables for both charm

and bottom with the same detector and technique is crucial in providing constraints to state-of-the-art theoretical predictions.

Finally, azimuthal correlations and yields of heavy-flavor muon pairs in Pb+Pb collisions are compared to the  $pp$  reference and are quantified by the nuclear-modification factor  $R_{AA}$ ,

The modifications of the widths of these correlations are also measured.

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