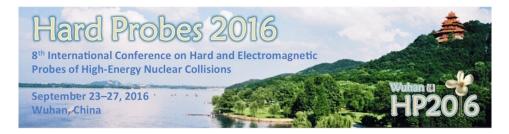Contribution ID: **143**   Type: **not specified**

Heavy flavor R_{AA} and v_n in event-by-event viscous relativistic hydrodynamics

Saturday, 24 September 2016 09:30 (20 minutes)

Event-by-event fluctuations play a key role in resolving the long-standing v_2 to R_{AA} puzzle for jets [1]. In this talk, the same general idea employed in [1] is used to investigate the event-by-event properties of R_{AA} and v_n of heavy flavor. Heavy quarks propagate and lose energy in the medium described by the 2D+1 viscous hydrodynamic code v-USPhydro [3] on an event-by-event basis, which allows for the first calculation of high p_T elliptic flow cumulants $v_2\{2\}$, $v_2\{4\}$, $v_2\{6\}$, $v_2\{8\}$ for heavy flavor (and non-photonic electrons). We find that heavy flavor $v_2\{4\} = v_2\{6\} = v_2\{8\}$ at high pT, a strong indication that there is collectivity in the heavy flavor sector. We present predictions for heavy flavor $v_3\{2\}$ at LHC and discuss how event engineering in the soft sector [1] can be used to find the path length dependence of heavy quarks in the medium in highly anisotropic events.

REFERENCES:

[1] J.~Noronha-Hostler, B.~Betz, J.~Noronha and M.~Gyulassy,
Phys.\ Rev.\ Lett.\ {\bf 116}, 252301 (2016).

[2] J.~Noronha-Hostler, G.~S.~Denicol, J.~Noronha, R.~P.~G.~Andrade and F.~Grassi,
Phys.\ Rev.\ C {\bf 88}, 044916 (2013); J.~Noronha-Hostler, J.~Noronha and F.~Grassi,
Phys.\ Rev.\ C {\bf 90}, no. 3, 034907 (2014).

Summary

Event-by-event fluctuations play a key role in resolving the long-standing v_2 to R_{AA} puzzle for jets [1]. In this talk, the same general idea employed in [1] is used to investigate the event-by-event properties of R_{AA} and v_n of heavy flavor. Heavy quarks propagate and lose energy in the medium described by the 2D+1 viscous hydrodynamic code v-USPhydro [3] on an event-by-event basis, which allows for the first calculation of high p_T elliptic flow cumulants $v_2\{2\}$, $v_2\{4\}$, $v_2\{6\}$, $v_2\{8\}$ for heavy flavor (and non-photonic electrons). We find that heavy flavor $v_2\{4\} = v_2\{6\} = v_2\{8\}$ at high pT, a strong indication that there is collectivity in the heavy flavor sector. We present predictions for heavy flavor $v_3\{2\}$ at LHC and discuss how event engineering in the soft sector [1] can be used to find the path length dependence of heavy quarks in the medium in highly anisotropic events.

REFERENCES:

[1] J.~Noronha-Hostler, B.~Betz, J.~Noronha and M.~Gyulassy,
Phys.\ Rev.\ Lett.\ {\bf 116}, 252301 (2016).

[2] J.~Noronha-Hostler, G.~S.~Denicol, J.~Noronha, R.~P.~G.~Andrade and F.~Grassi,
Phys.\ Rev.\ C {\bf 88}, 044916 (2013); J.~Noronha-Hostler, J.~Noronha and F.~Grassi,
Phys.\ Rev.\ C {\bf 90}, no. 3, 034907 (2014).

Presentation type

Oral

Primary author: NORONHA, Jorge (University of Sao Paulo)

Presenter: NORONHA, Jorge (University of Sao Paulo)

Session Classification: Parallel Session I: Heavy Flavor (I)