

XXVIII International Workshop on Deep-Inelastic Scattering and Related Subjects



Contribution ID: 493

Type: **Contributed Talk**

Transverse Single Spin Asymmetries of Heavy Flavor Electrons and Charged Pions in 200 GeV $p + p^\uparrow$ Collisions at Midrapidity

Tuesday, 13 April 2021 10:01 (18 minutes)

Understanding the transverse spin and momentum structure of the proton is of large interest to the nuclear physics community and it is one of the main goals of the spin physics program at the Relativistic Heavy Ion Collider (RHIC). Transverse single spin asymmetry measurements for charged particles produced in proton proton collisions provide keen insight into initial and final state spin-momentum and spin-spin correlations of partons within hadrons. In particular, electrons from heavy flavor decays provide access to initial state spin-momentum correlations of gluons in the proton, while charged pions provide access to both initial and final state transverse spin effects of quarks and gluons. Electrons and charged pions are measured at midrapidity at PHENIX using the central arm spectrometers which consist of an Electro-Magnetic Calorimeter, a Ring-imaging Cherenkov Detector, as well as Drift and Pad Chambers. In addition, the heavy flavor decay electron analysis uses the Silicon Vertex Detector (SVX) in order to veto background from conversion electrons. The status of both the electron and charged pion measurements from the 2015 running period (200 GeV $p + p^\uparrow$) will be presented including the recent result for the transverse single spin asymmetry of electrons from open heavy flavor decays.

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Session Classification: Spin Physics

Track Classification: Spin Physics