

1 Azimuthal Transverse Single-Spin Asymmetries of Charged
2 Pions Within Jets from Polarized pp Collisions at $\sqrt{s} = 200$
3 GeV

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6 **Abstract**

7 The Collins effect involves the convolution of the quark transversity in the proton with the
8 spin-dependent Collins fragmentation function, leading to azimuthal modulations of identified
9 charged hadron yields about the jet axis. STAR has reported the first measurements of Collins
10 asymmetries for charged pions in jets in polarized pp collisions at $\sqrt{s} = 500$ GeV and 200
11 GeV, based on data taken during 2011 and 2012. The results probe transversity for quark
12 momentum fractions $0.1 \leq x \leq 0.4$ at Q^2 scales that are one to two orders of magnitude larger
13 than similar measurements in semi-inclusive deep-inelastic scatterings. These hadron-in-jet
14 measurements also provide a direct probe of the Collins fragmentation function and enable
15 testing its evolution, universality and factorization breaking in the transverse momentum
16 dependent formalism. New preliminary results for the Collins asymmetries of charged pions
17 in jets from 2015 pp collisions at $\sqrt{s} = 200$ GeV with a much larger sample size and improved
18 analysis procedures that lead to smaller systematic uncertainties will be presented.