

1 **Transverse Single-Spin Asymmetry for Electromagnetic Jets at Forward Rapidities in**
2 **p[↑]+p Collisions at $\sqrt{s} = 200$ GeV at STAR**

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5 **Abstract**

6 There have been various attempts, both experimentally and theoretically, to understand the origin
7 of the unexpectedly large transverse single-spin asymmetries (A_N) for inclusive hadron produc-
8 tion at forward rapidity in p[↑]+p collisions that persist from low to high center-of-mass energies.
9 Two proposed potential sources are the twist-3 contributions in the collinear factorization and the
10 transverse-momentum-dependent contributions from either the initial-state quark and gluon Sivers
11 functions or the final-state Collins fragmentation function. Jet A_N is sensitive to the initial state
12 effect and can provide access to Sivers functions. A_N for jets of different substructures can help
13 better understand the underlying mechanism for the observed large A_N . Transversely polarized
14 p[↑]+p collisions at RHIC are ideal to disentangle the initial and final state effects. The STAR
15 Forward Meson Spectrometer (FMS) and Endcap Electromagnetic Calorimeter (EEMC), having
16 pseudo-rapidity coverages of 2.6 - 4.2 and 1.1 - 2.0 respectively, can be used to detect photons,
17 neutral pions, and eta mesons. We present preliminary results of A_N for electromagnetic jets in
18 FMS and EEMC using p[↑]+p collisions at $\sqrt{s} = 200$ GeV where we explore the dependences of A_N
19 on photon multiplicity inside the jet, jet transverse momentum, and jet energy.