Transverse Single-Spin Asymmetry for inclusive and diffractive Electromagnetic jet with $p^{\uparrow} + p$ collision at $\sqrt{s}$=200 GeV

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The STAR Collaboration reports the measurements of transverse single-spin asymmetry, A_N, for inclusive and diffractive electromagnetic jets (EM-jets) at center-of-mass energy of 200 GeV in transversely polarized proton-proton collisions in the pseudorapidity region of 2.6 to 4.1. The photon-multiplicity dependent A_N results of inclusive EM-jets are investigated, which show the A_N of lower photon-multiplicity inclusive EM-jets is significantly larger than that of higher photon-multiplicity inclusive EM-jets. The A_N of inclusive EM-jets is observed to increase with increasing Feynman x (x_F) regardless of the photon-multiplicity of the inclusive EM-jets. For the diffractive EM-jets, the non-zero A_N is observed with 3.8-sigma significance. However, the A_N value is negative, which is opposite to the results for inclusive EM-jets A_N.