Reconstruction of neutral-triggered charged recoil jets in $\sqrt{s} = 200$ GeV p+p collisions at the STAR experiment

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Jets - collimated sprays of hadrons - are produced by the hard-scattering of partons during the early stages of heavy-ion collisions. Hence they provide a valuable probe of the complex, multi-particle dynamics within the hot, dense medium produced in such collisions. In particular, the study of jets recoiling from direct photons (γ_{dir}+jet) may shed light on the energy-loss experienced by a parton as it traverses the medium[1]. Since a γ_{dir} does not strongly interact with the medium, its energy closely approximates the initial energy of the recoiling parton. Moreover, it is interesting to compare γ_{dir}+jet to jets recoiling from energetic π^0 (π^0+jet). As there are several differences in the production of γ_{dir}+jet vs. π^0+jet, including a surface bias in the selection of π^0 triggers and a dominance of quark jets recoiling from the γ_{dir} triggers, one may anticipate a difference in the energy loss experienced by γ_{dir}-triggered recoil jets relative to the π^0-triggered recoil jets.

In this poster we will present the measurement of the yields of charged recoil jets in p+p-collisions at $\sqrt{s} = 200$ GeV which will serve as a vacuum fragmentation reference. The charged particles in the jets are measured using the STAR Time Projection Chamber, and the γ_{dir}/π^0 triggers are measured using the STAR Barrel Electromagnetic Calorimeter. The neutral-particle triggers satisfy $9 < E_T^{trg} < 20$ GeV and $|\eta^{trg}| < 0.9$, and jets are reconstructed from charged tracks with $p_T^{trk} > 0.2$ GeV/c and $|\eta^{trk}| < 1$ using the anti-k_T algorithm for various resolution parameters. The data are corrected for instrumental effects using an iterative Bayesian unfolding procedure[2] and then compared to PYTHIA 8 simulations[3].

[1] X.-N. Wang, Z. Huang, and I. Sarcevic, Phys. Rev. Lett. 77, 231 (1996)

[2] G. D'Agostini, Nucl. Instrum. Meth. A 362, 487 (1995)

[3] T. Sjöstrand, S. Mrenna and P. Z. Skands, Comput. Phys. Commun. 178 (2008) 852 [arXiv:0710.3820 [hep-ph]]