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**Why the $x_E$ distribution triggered by a pizero does not measure the fragmentation function** MICHAEL TANNENBAUM, Brookhaven National Laboratory — Hard-scattering in pp collisions was discovered at the CERN-ISR in 1972 by measurements utilizing inclusive single or pairs of hadrons. Due to the steeply falling power-law $p_T$ spectrum of the scattered partons, the inclusive single particle (e.g. pizero) spectrum from jet fragmentation is dominated by trigger fragments with large $\langle z_t \rangle \sim 0.7 - 0.8$, where $z_t = p_{T_t}/p_{T\text{jet}}$ is the fragmentation variable. It was generally assumed, following Feynman, Field and Fox, as shown by data from the CERN-ISR experiments, that the $p_{T_a}$ distribution of away side hadrons from a single particle trigger [with $p_{T_t}$], corrected for $\langle z_t \rangle$, would be the same as that from a jet-trigger and follow the same fragmentation function as observed in $e^+e^-$ or DIS. PHENIX attempted to measure the fragmentation function from the away side $x_E \sim p_{T_a}/p_{T_t}$ distribution of charged particles triggered by a $\pi^0$ in p-p collisions and showed by explicit numerical calculation that the $x_E$ distribution was actually quite insensitive to the fragmentation function. The lack of sensitivity to the fragmentation function will be explained, and an analytic formula for the $x_E$ distribution given. The away-side distribution has the nice property that it both exhibits $x_E$ scaling and is directly sensitive to the ratio of the away jet $\hat{p}_{T_a}$ to that of the trigger jet, $\hat{p}_{T_t}$ and thus to the relative energy loss of the two jets escaping from the medium in RHI collisions. Applications to measurements from Au+Au collisions at RHIC will be presented, leading to some interesting conclusions.

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