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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 π^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.

Prefer Oral Session
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