

Emerging Jet Analysis Update

BRANDON DEATH

CARLETON UNIVERSITY

JULY 16, 2020



Cuts

- Compare energy/pT difference of initial quark pairs
- Only Down quarks are produced for SM quark

$$\chi_d \rightarrow d \qquad \bar{\chi}_d \rightarrow \bar{d}$$

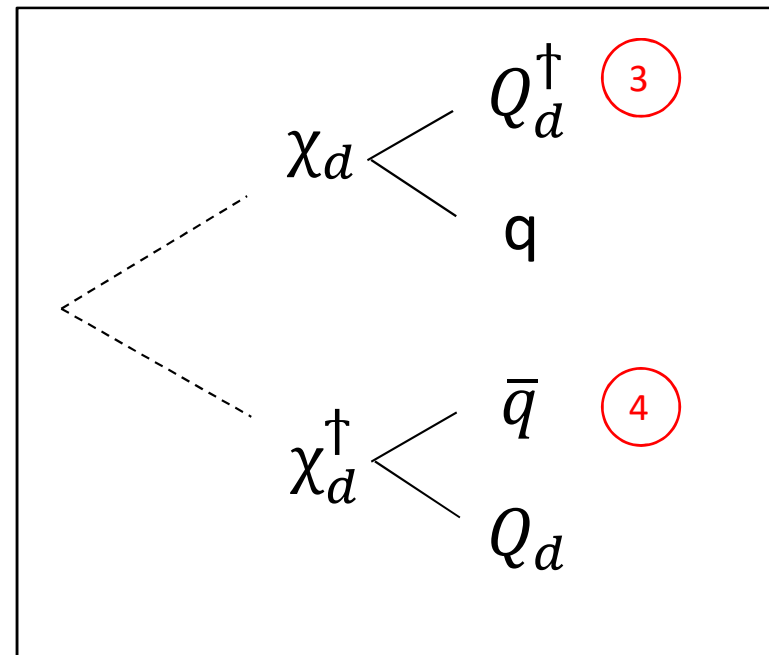
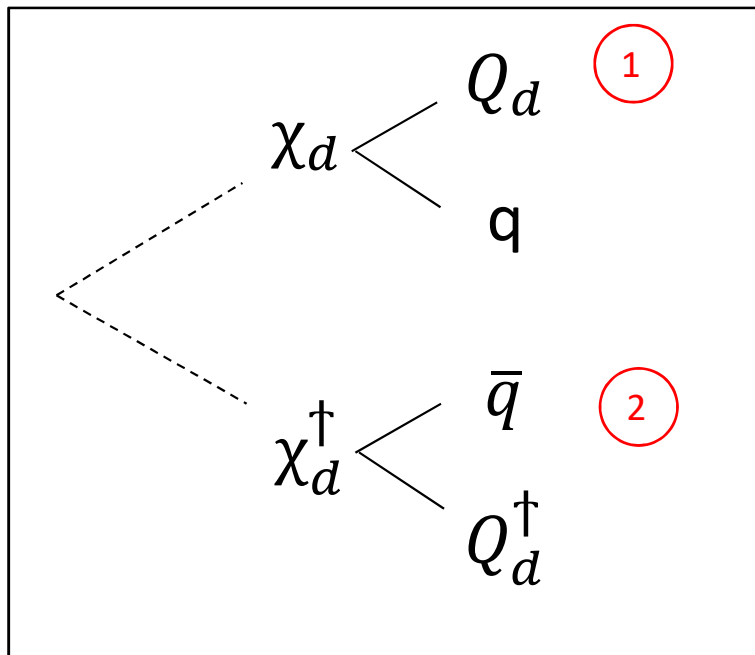
- SM Quark Cut

`truthPart_pdgId->at(n) == 1 && truthPart_parent_pdgId->at(n) == 4900001`

- Dark quark cut

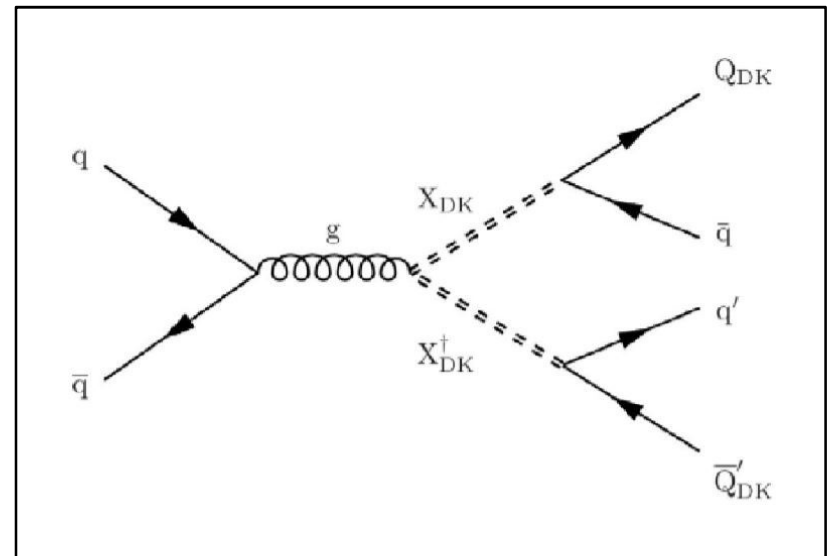
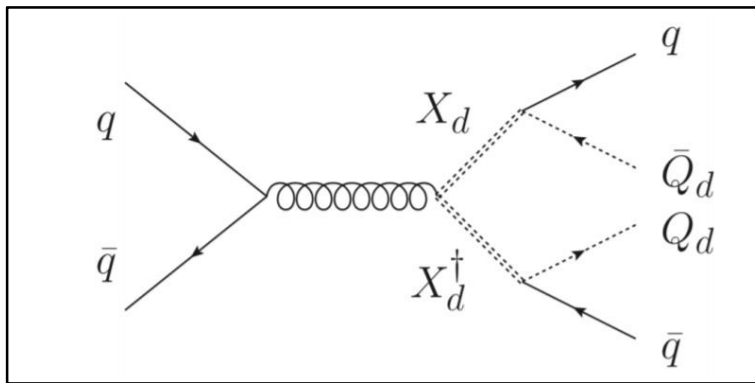
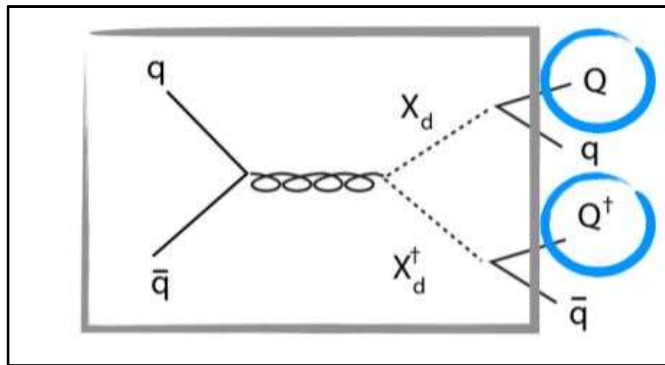
`truthPart_pdgId->at(n) == 4900101 && truthPart_status->at(n) == 71`

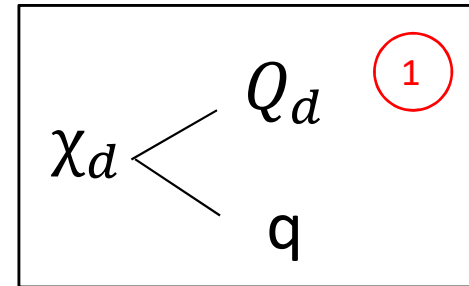
Quark Pairs



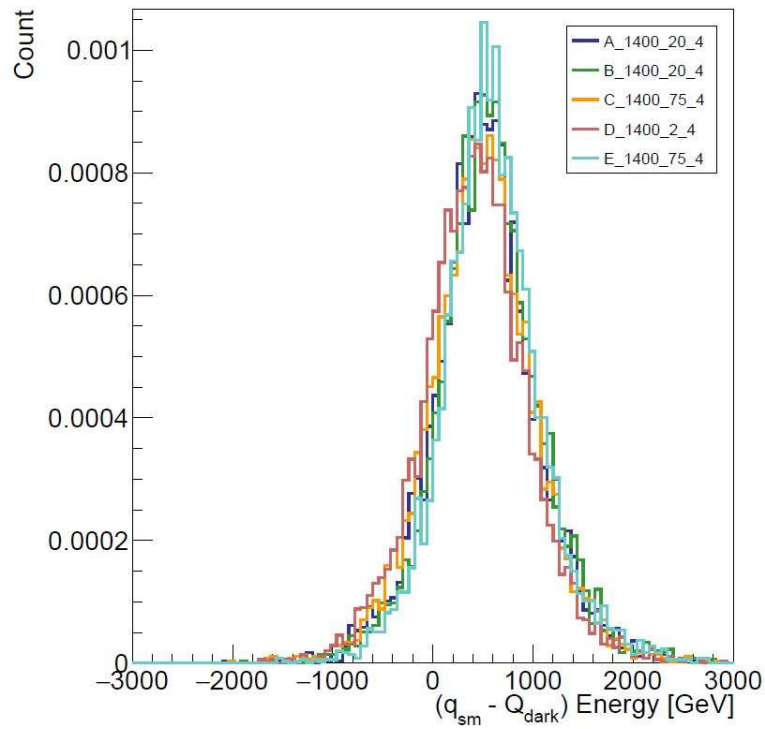
SM quarks are only Down quarks

Different Quark Pairs

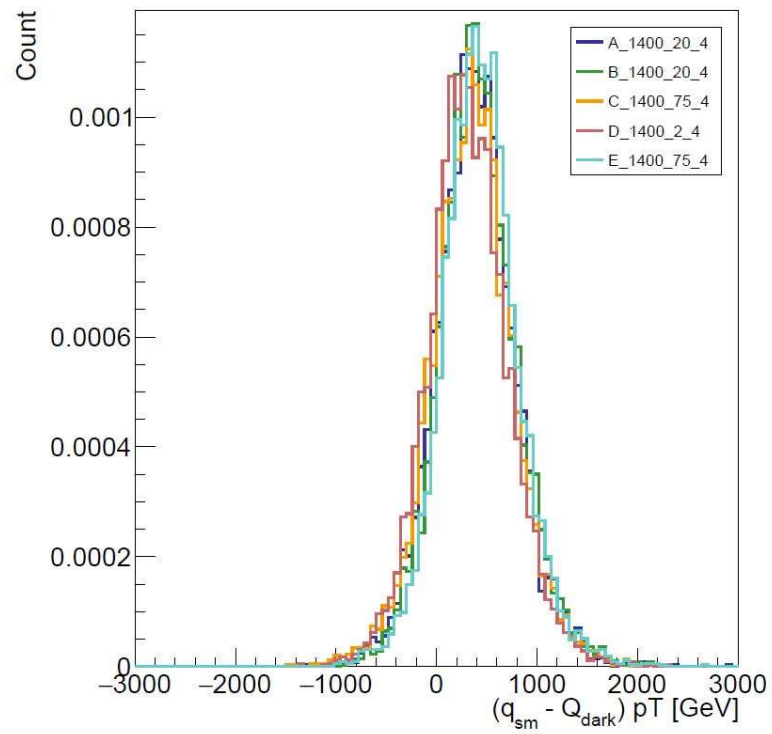


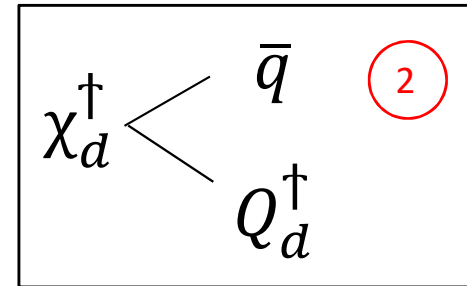


(SM Quark - Dark Quark) Energy

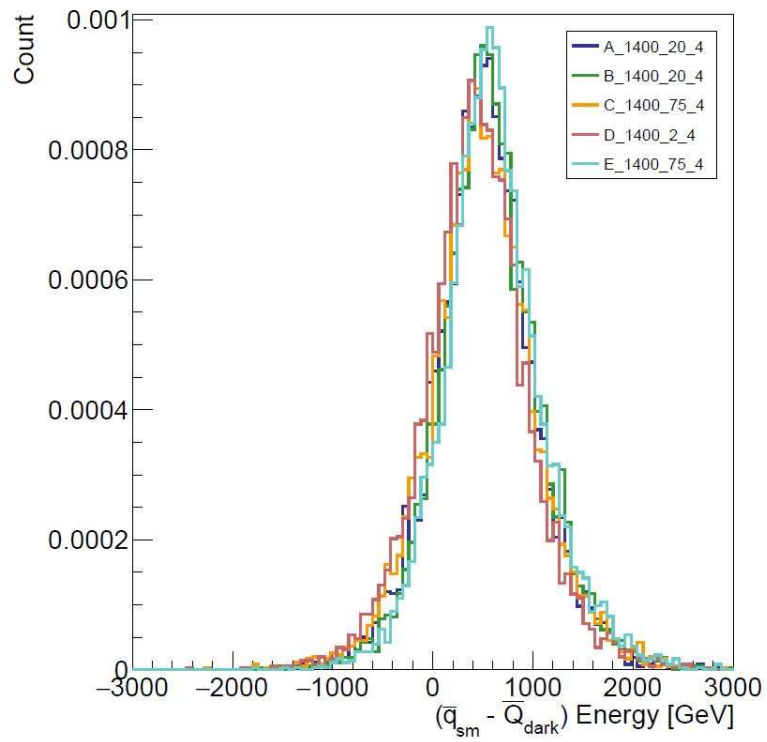


(SM Quark - Dark Quark) pT

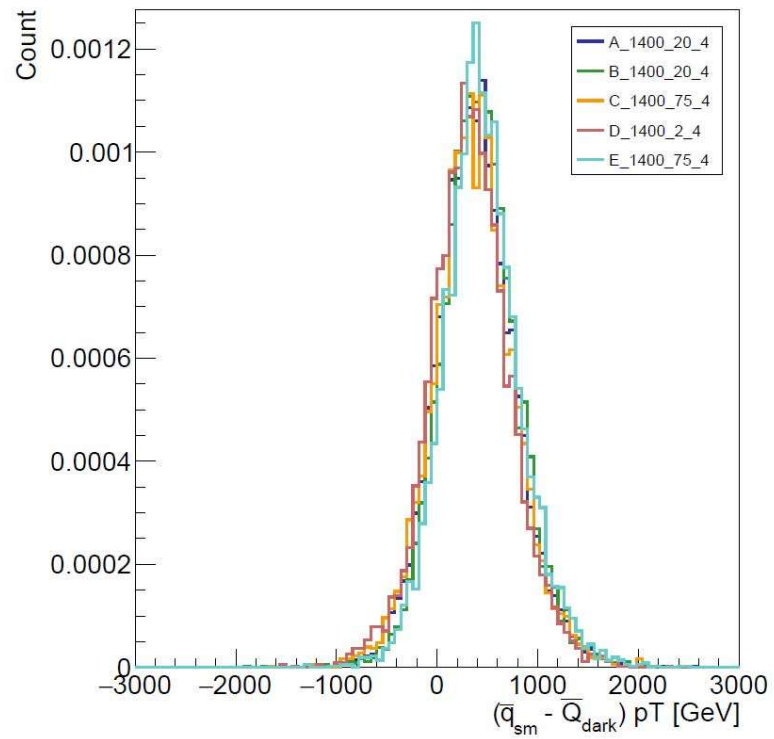


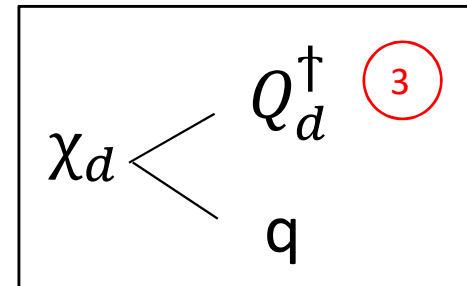


(SM AntiQuark - Dark AntiQuark) Energy

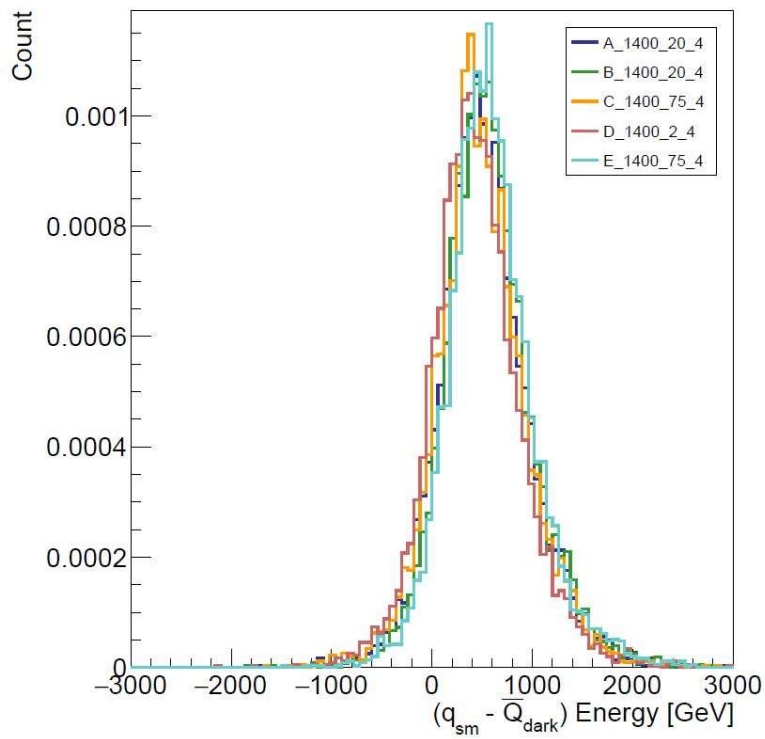


(SM AntiQuark - Dark AntiQuark) pT

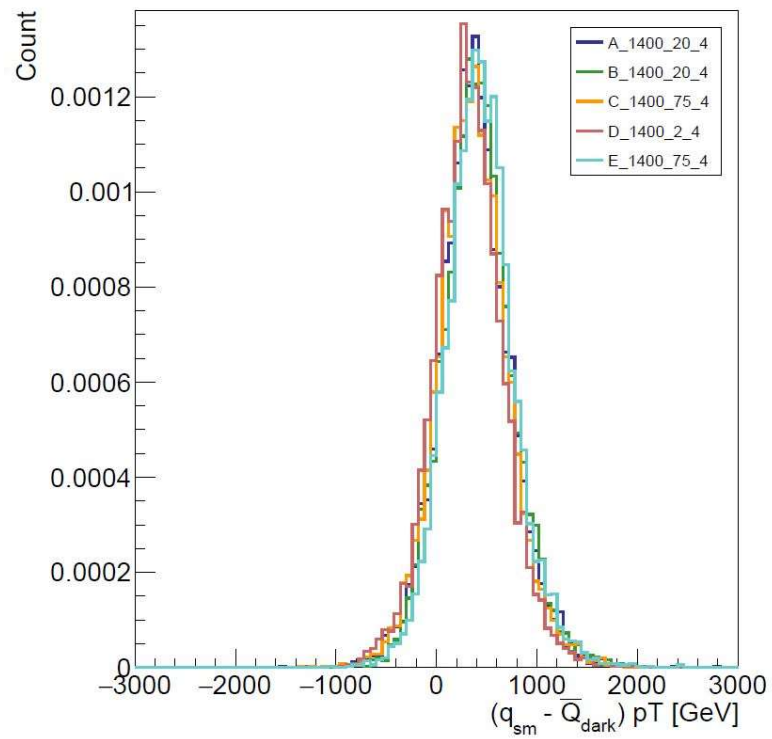


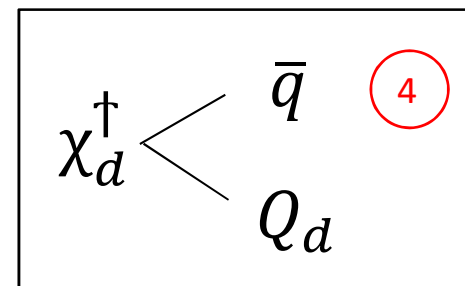


(SM Quark - Dark AntiQuark) Energy

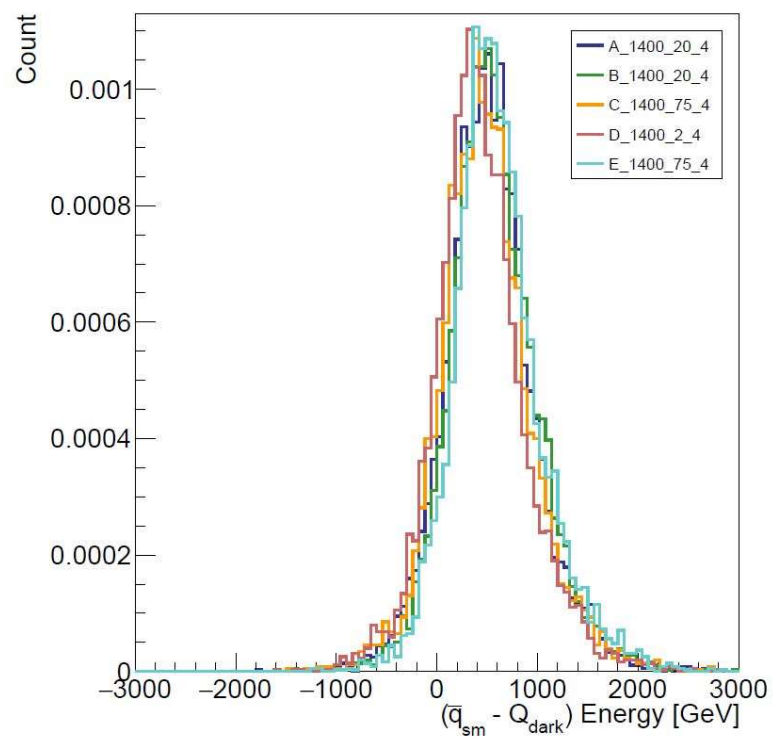


(SM Quark - Dark AntiQuark) pT

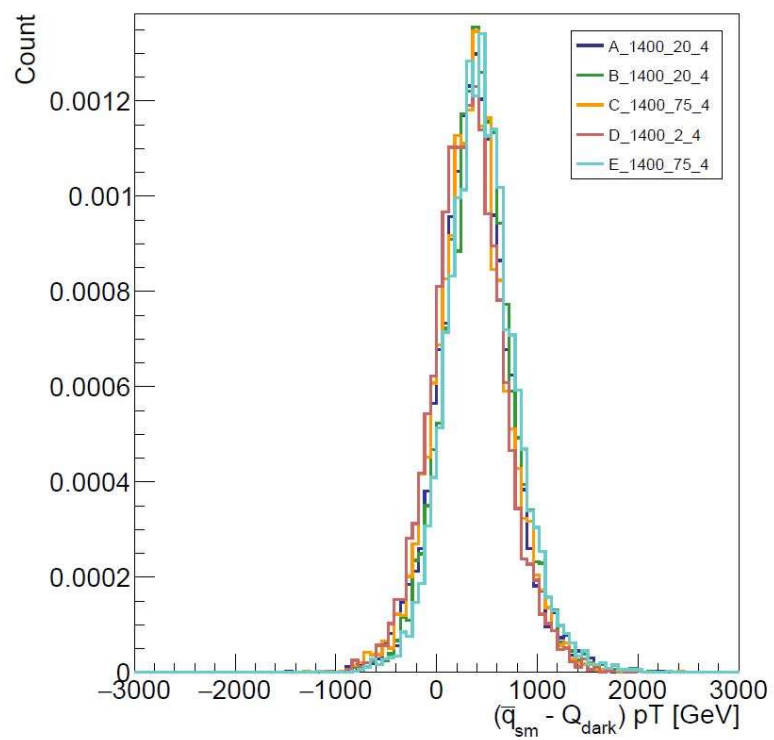




(SM AntiQuark - Dark Quark) Energy

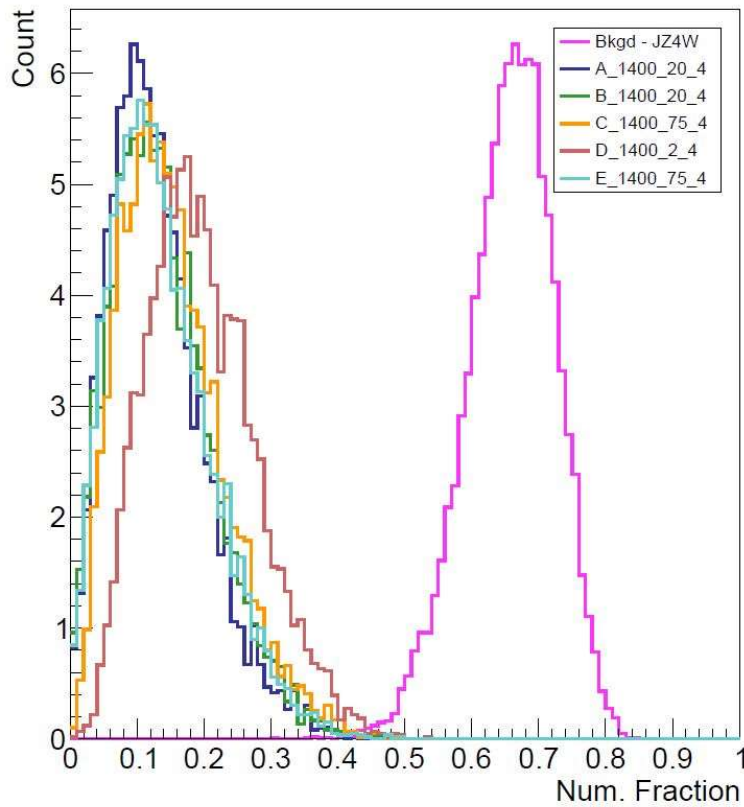


(SM AntiQuark - Dark Quark) pT

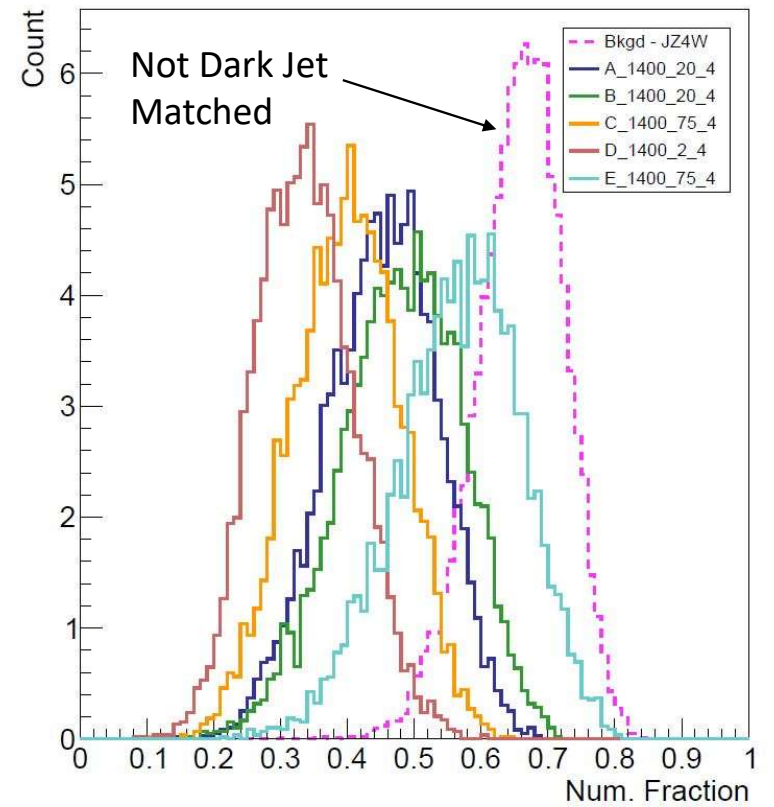


Fraction of Particles (Excluding Pions, Kaons & Rho)

Not Dark Jet Matched

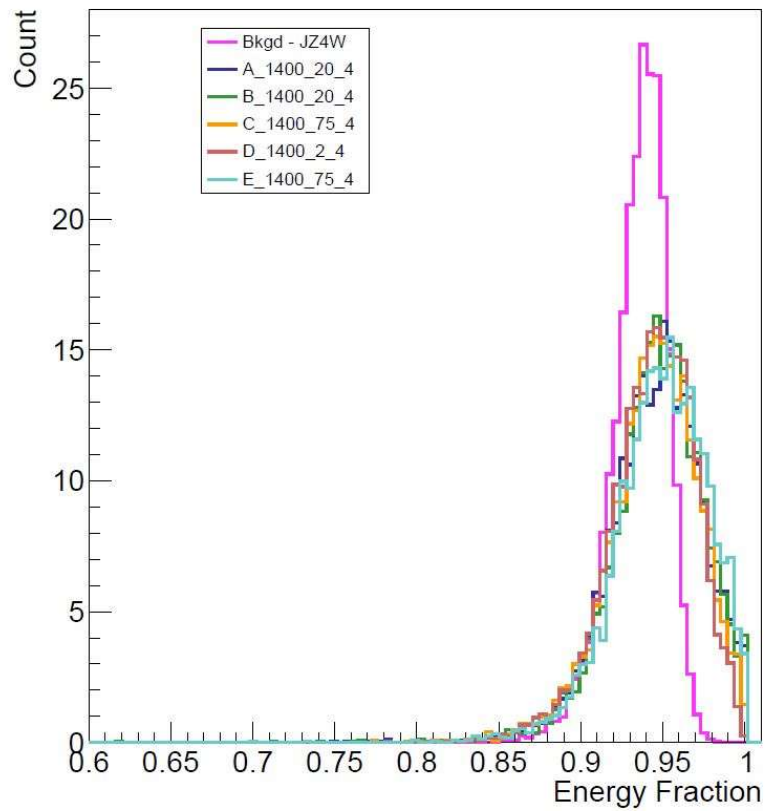


Dark Jet Matched



Total Energy Fraction (Excluding Pions, Kaons & Rho)

Not Dark Jet Matched



Dark Jet Matched

