b-tagging at CLD

polar angle dependence

forward

central

$E_{cm} = 91$ GeV

$E_{cm} = 365$ GeV
In general:
- CM dependence: better agreement truth/conformal at 91 GeV
- theta dependence: better agreement truth/conformal in forward
c-tagging at CLD

polar angle dependence

$E_{cm} = 91$ GeV

Di-jet events, $E_{cm} = 91$ GeV

Beauty contamination
Truth tracking
Conformal tracking

LF contamination
Conformal tracking

Charm eff.

$E_{cm} = 365$ GeV

Di-jet events, $E_{cm} = 365$ GeV

Beauty contamination
Truth tracking
Conformal tracking

LF contamination
Conformal tracking

Charm eff.
In general:
- CM dependence: better agreement truth/conformal at 91 GeV
- theta dependence: better agreement truth/conformal in forward
- flavour dependence: better agreement truth/conformal in c-tag
Ecm = 91 GeV
p(quark) = 45 GeV

b quark: m = 5 GeV, ct = 500 µm
=> γ = sqrt(1+(p/m)^2) = 9.05539
=> ctγ = 4.53 mm

c quark: m = 2 GeV, ct = 300 µm
=> γ = sqrt(1+(p/m)^2) = 22.0227
=> ctγ = 6.6 mm

L = ctγ * sinθ

θ = 20deg => L(b) = 1.55 mm, L(c) = 2.26 mm
θ = 80deg => L(b) = 4.46 mm, L(c) = 6.5 mm

Ecm = 365 GeV
p(quark) = 182.5 GeV

b quark: m = 5 GeV, ct = 500 µm
=> γ = sqrt(1+(p/m)^2) = 36.5137
=> ctγ = 18.26 mm

c quark: m = 2 GeV, ct = 300 µm
=> γ = sqrt(1+(p/m)^2) = 91.2555
=> ctγ = 27.38 mm

L = ctγ * sinθ

θ = 20deg => L(b) = 6.25 mm, L(c) = 9.36 mm
θ = 80deg => L(b) = 17.98 mm, L(c) = 26.96 mm

All other cases except this one: quarks decay before any sensitive layer.
b&c-tagging at 91GeV [same as top row of slide #1&2]
b&c-tagging at 91 GeV with optimized BDT (MaxDepth = 3)
In general:
- BDT with MaxDepth = 3 gives better absolute tagging performance
- however, it does not help in the discrepancy truth vs conformal
Di-jet events, $E_{\text{CM}} = 91$ GeV, $\theta = 50$°

Charm contamination

Beauty contamination

LF contamination

Charm eff.

Beauty eff.

LF eff.

Misidentification eff.

truth/conformal

Conformal tracking

Truth tracking

FCC-ee work in progress

polar angle dependence
b&c-tagging at 365GeV with optimized BDT (MaxDepth = 3)

forward
polar angle dependence

central
In general:
- BDT with MaxDepth = 3 gives better absolute tagging performance
- however, it does not help in the discrepancy truth vs conformal