The taus, what about the taus?

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Belle Starr: Recap

- Coincidence hit selection
- Clusterize hits
- Perform first single shower M-estimator prefit
- Residual based hit selection $-40\,\text{ns} > h.t > 40\,\text{ns}$
- Clusterize hits
- Perform second single shower M-estimator prefit
- Perform a two shower PDF based likelihood fit on all hits in event, with likelihood:

$$\mathcal{L} = \sum_i P(\text{hit}_i|\text{vertex}_1) + P(\text{hit}_i|\text{vertex}_2) + P(\text{hit}_i|\text{bkg})$$

Toy MC for Bjorken y studies

- Simulate 100 hundred events per energy distribution
- The hadronic and tau decay shower are at a set distance and both contained
- Change energy distribution but keep distance fixed ("unlikely events")
- → Files with 100 events with per event same shower position only difference is energy distribution

Belle Starr performance for different bjorken y

Toy MC for effect of bjorken y: sim length 60 m energy percentage of tau 20 % to 80 %
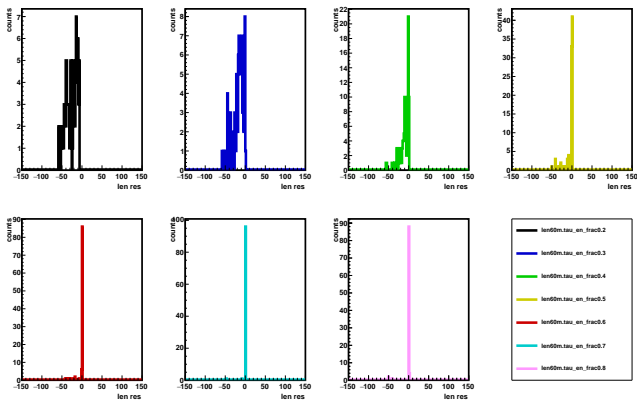

Figure : Reconstructed dst resolution for different bjorken y values at same flight length (between 60 meter)

Belle Starr performance for different bjorken y

Toy MC for effect of bjorken y: sim length 20 m energy percentage of tau 20 % to 80 %
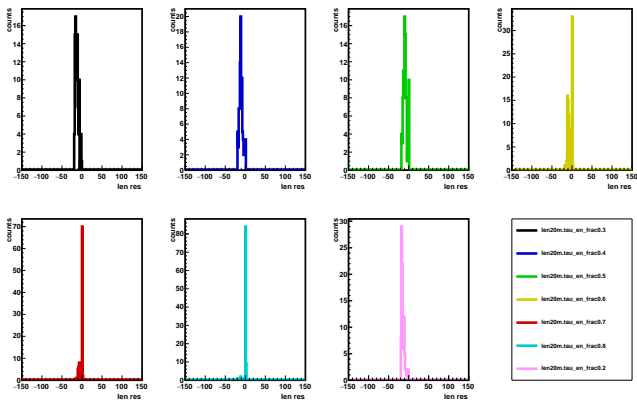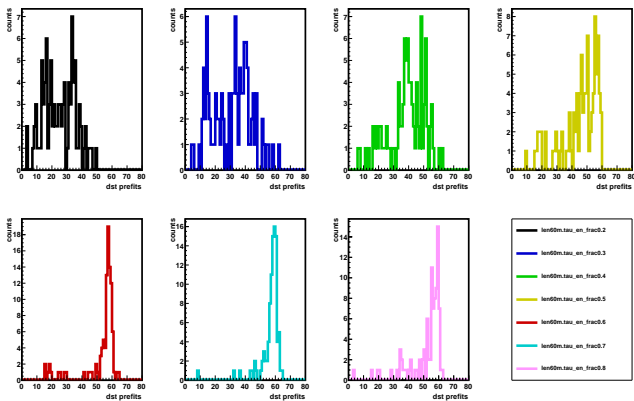

Figure : Reconstructed dst resolution for different bjorken y values at same flight length (between 20 meter)

Toy MC for effect of bjorken y: sim length 60 m energy percentage of tau 20 % to 80 %

Figure : Prefit distance for different bjorken y values at same flight length (between 60 meter)

Toy MC for effect of bjorken y: sim length 20 m energy percentage of tau 20 % to 80 %
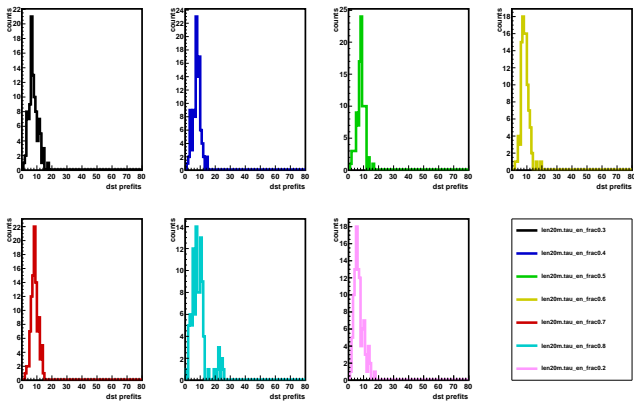

Figure : Prefit distance for different bjorken y values at same flight length (between 20 meter)

Belle Starr performance for different bjorken y, what is possible?

Toy MC for effect of bjorken y: sim length 20 m energy percentage of tau 20 % to 80 % use MC information as prefit
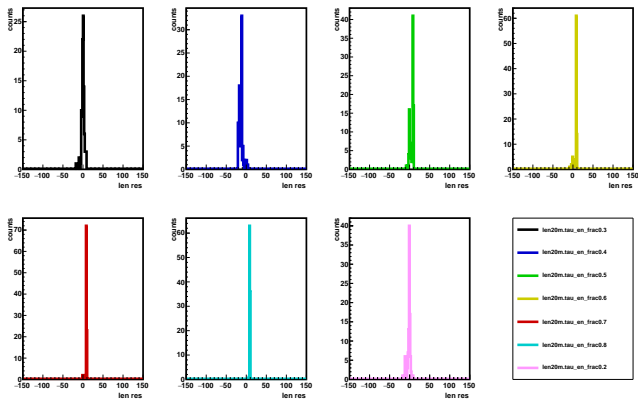

Figure : Reconstructed dst resolution for different bjorken y values at same flight length (between 20 meter), MC information for prefit, ignore