Reconstruction of D_s with HFT

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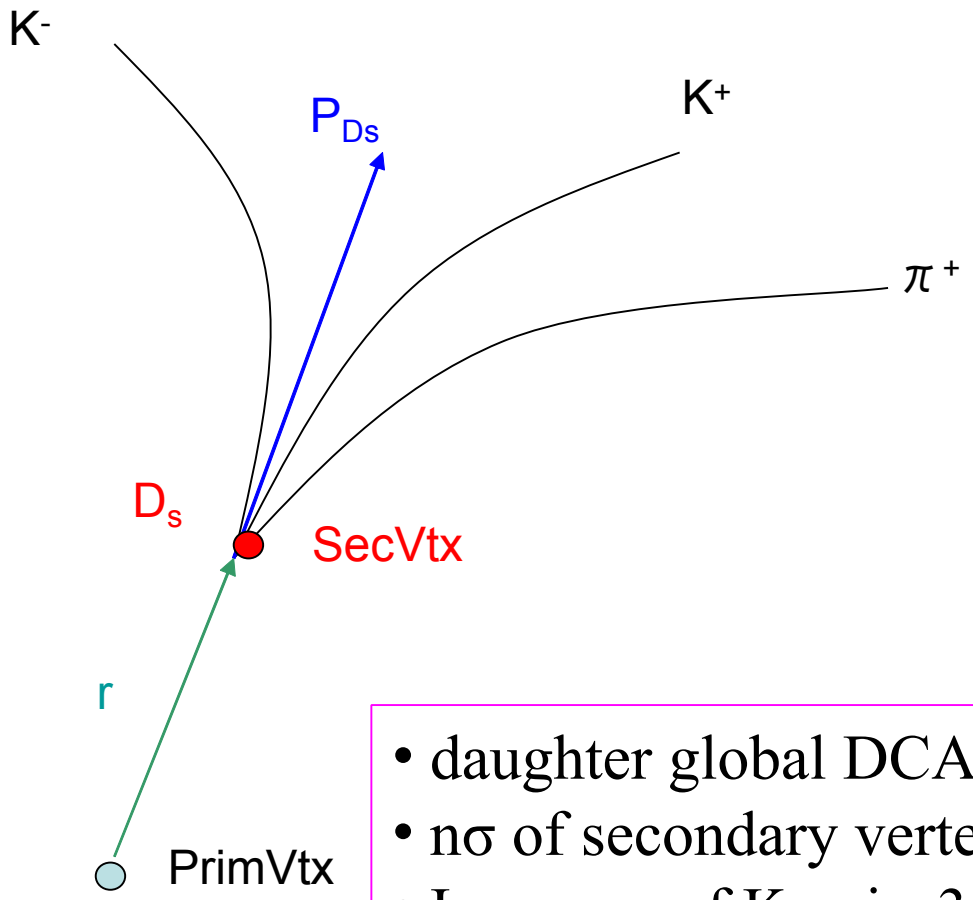
Data sets

- UPGR15 configuration
- One case: thin pixel layers
- 10k events for each case with |Vz| < 5 cm
- 10 D_s^+ per event (flat pT)
- 30 D_s^+ per event (power-law pT)
- 3-body decay via φ: $k^+ + k^- + pi^+$ (BR 2.32% or 5.5%)
- Decay daughter: $p_T > 0.2$ GeV/c, |Eta| < 0.9
- Only the two pixel layers are used
- Assuming ideal PID for decay daughters

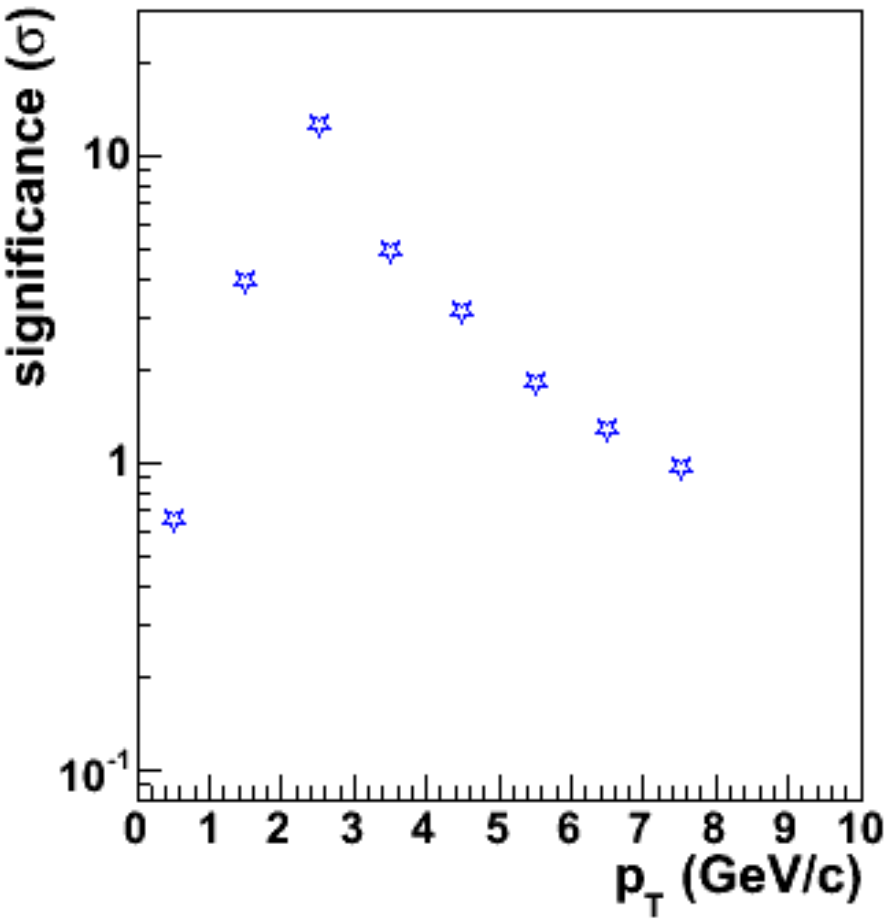
Effective cuts

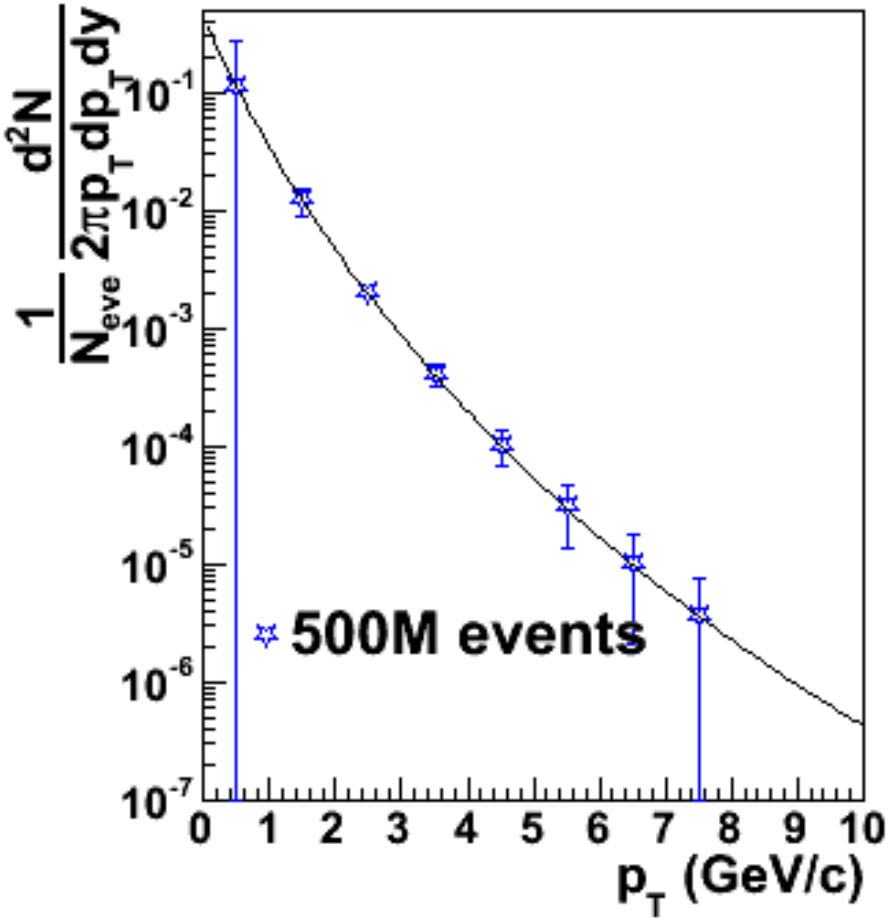


- daughter global DCA to PrimVtx: > 80 um (-> 70 um)
- nσ of secondary vertex: within 2σ (-> 2.5σ)
- Inv mass of K pair: 3 σ around φ mass (p_T< 4 GeV/c)
- cos(θ) > 0.99 (tried 0.98 with worse significance)

θ is the angle between r and P_{Ds}

Significance





Below 3 GeV/c, the simulation production with power-law.
Above 3 GeV/c, flat pT.
Below 4 GeV/c, cut on the inv mass of K pair, and BR is 2.32%.
Above 4 GeV/c, no requirement on the inv mass of K pair, and BR is 5.5%.

Outlook

With TOF info for Kaons, the K pair efficiency is around 50%. So the realisitc significnace should be reduced to 70% of what I show.