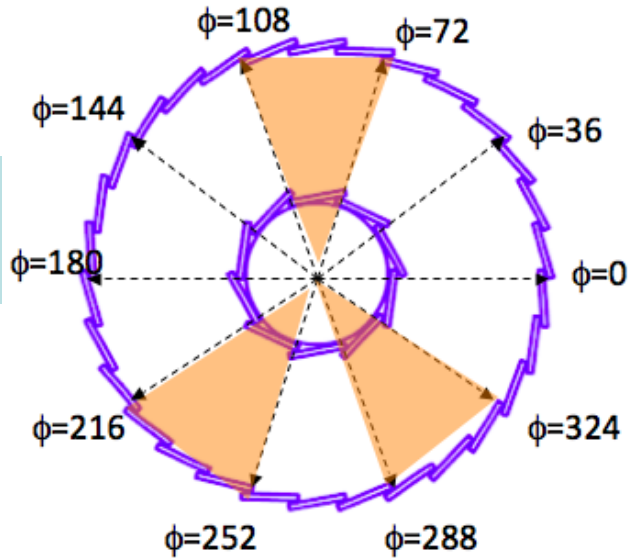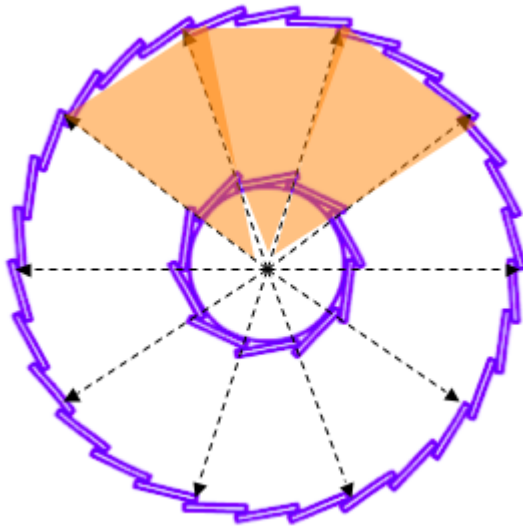# PIXEL patch efficiency

patch: triangle

patch: joined

- Update of friday's meeting.

- 2 configurations of pixel sectors (3 out of 10) are studied for reconstruction of low or high Pt D^0's.

  ➔ 2 different cuts on the Pt of daughters are used.

Simulation

- Generate 100k D^0 with :
  - Flat Pt in [0,5], $|\eta|<3, |Vz|<10$
- Use only fz file --> no reconstruction, etc …
- Count :
  - N0 : # of D^0 after Pt cut for both daughters and $|\eta| <1$
  - N1 : # of D^0 with above cuts + TPC>10,PXL=2
  - N2 : # of D^0 in triangle configuration
  - N3 : # of D^0 in joined configuration
- Then :
  - Eficiency $_{\text{triangle config.}}$ = N2 / N1
 - Efficiency $_{\text{joined config.}}$ = N3 / N1

Summary of plots

- Slide 4 : phase space of D^0 generated with Starsim

- Slide 5-7 : application of cut $| \eta | < 1$ and Pt of daughters : N0

- Slide 8-10 : application of cut $| \eta | < 1$, TPC>10, PIXL=2, and Pt of daughters : N1

- Slide 11-12 : application of cut $| \eta | < 1$, TPC>10, PIXL=2, and Pt of daughters and patch triangle : N2

- Slide 13-14 : application of cut $| \eta | < 1$, TPC>10, PIXL=2, and Pt of daughters and patch joined : N3
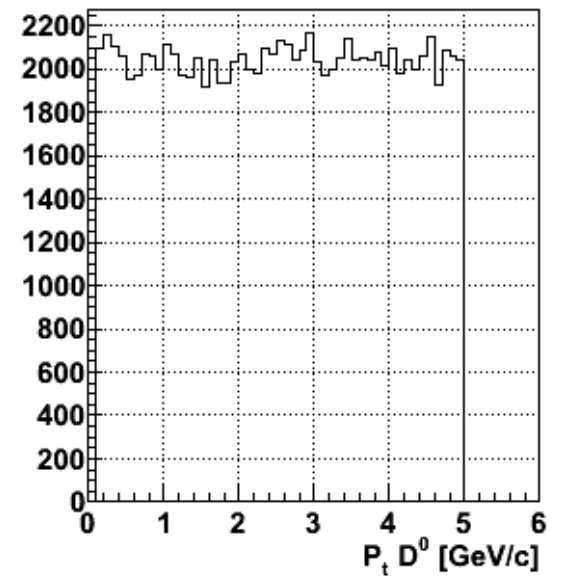
Phase space : default
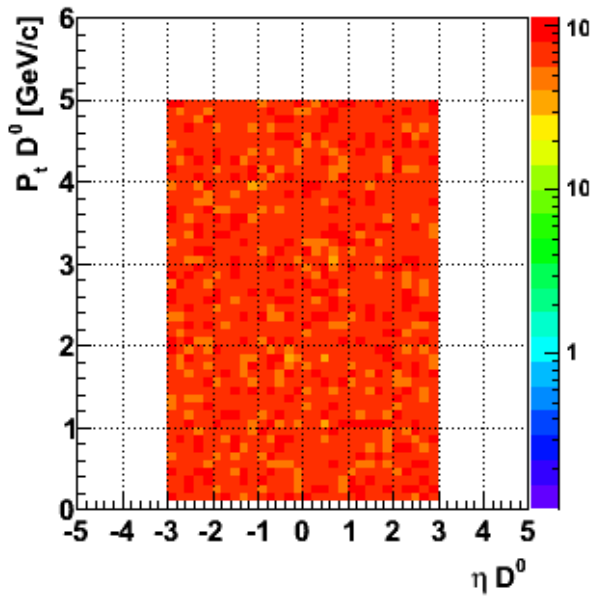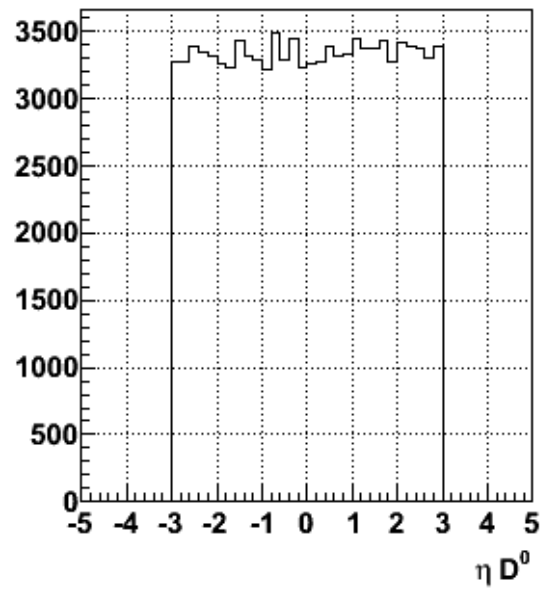
- Pt and η of the D^0's with Starsim

- Uniform distributions

Cut : |η|<1 , Pt>0.3
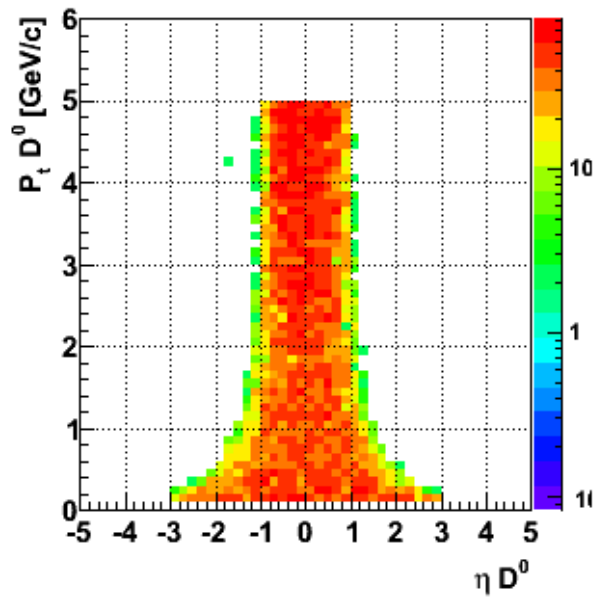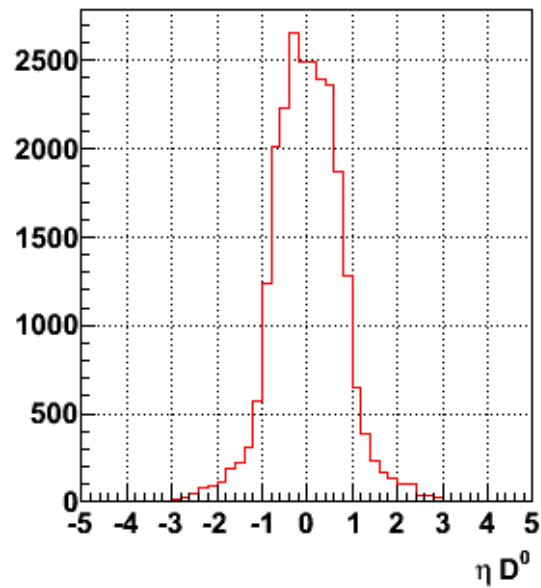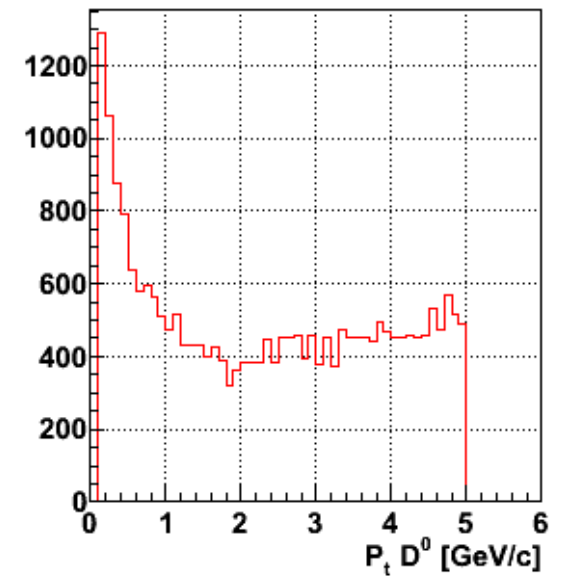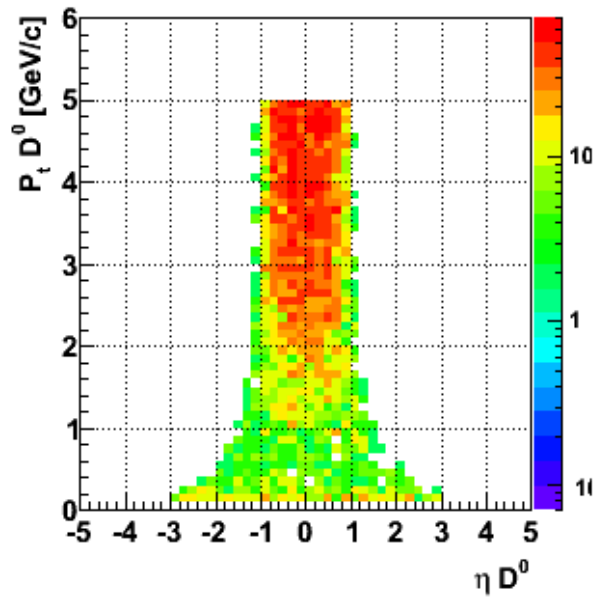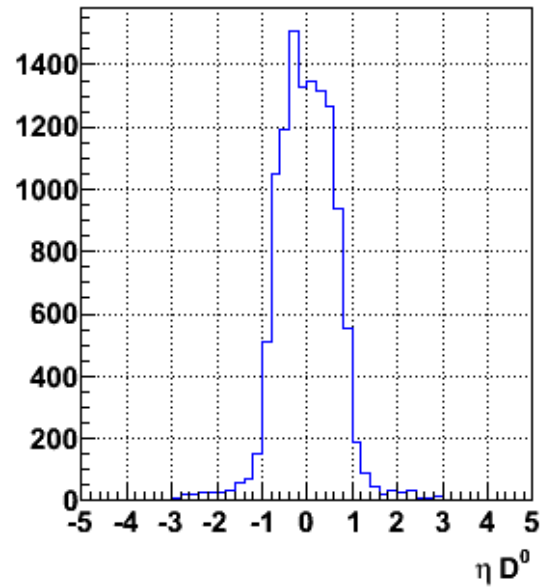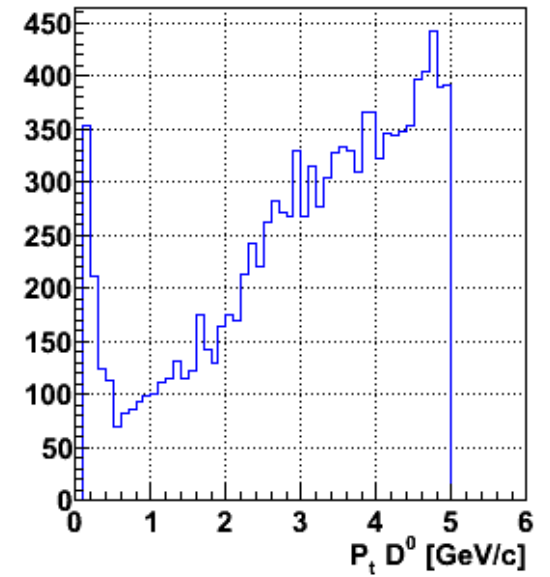
Cut : $|\eta|<1$, Pt>0.8

Cut : |η|<1 : comparison
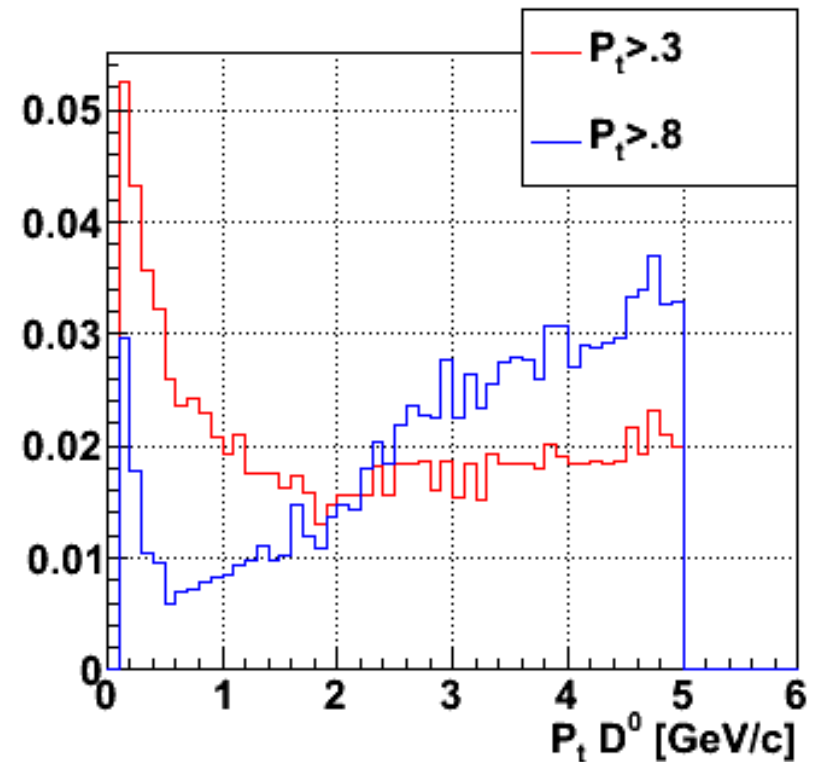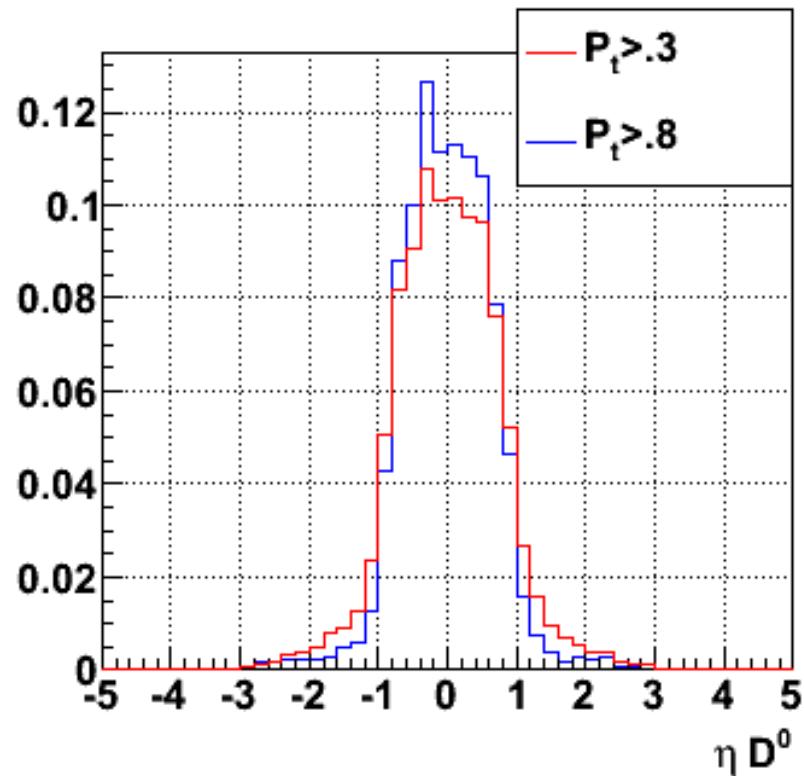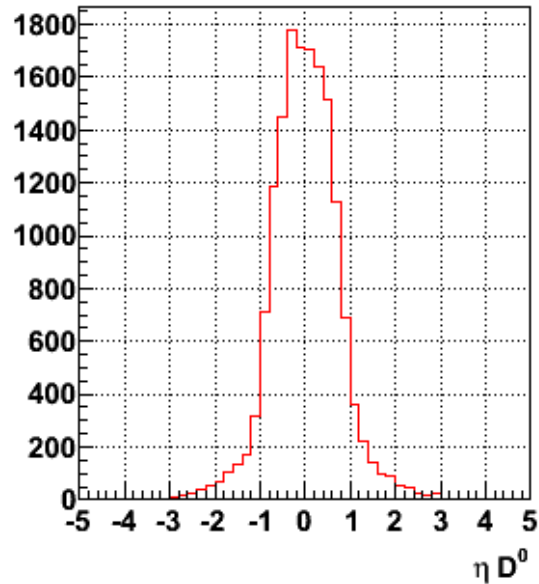

- η distributions are the same

- the cut Pt>.8 removes entries around Pt ~ 1GeV

Cut : |η|<1 , Pt>0.3, TPC>10,PIXL=2

P$_t$>0.3 GeV/c,TPC>10, PIXL=2
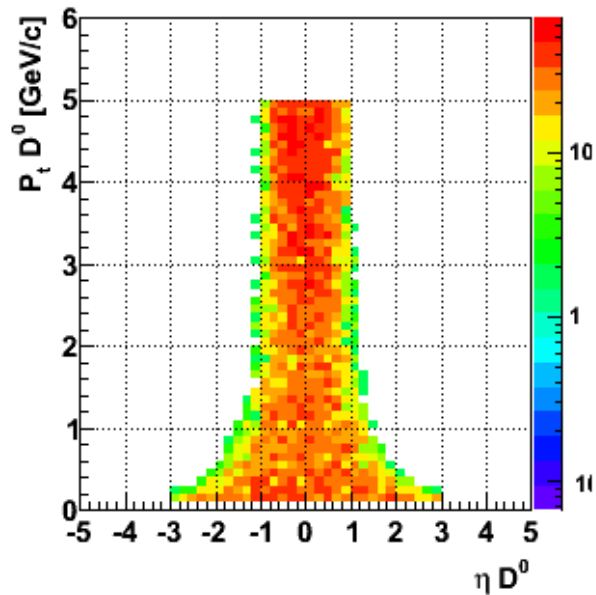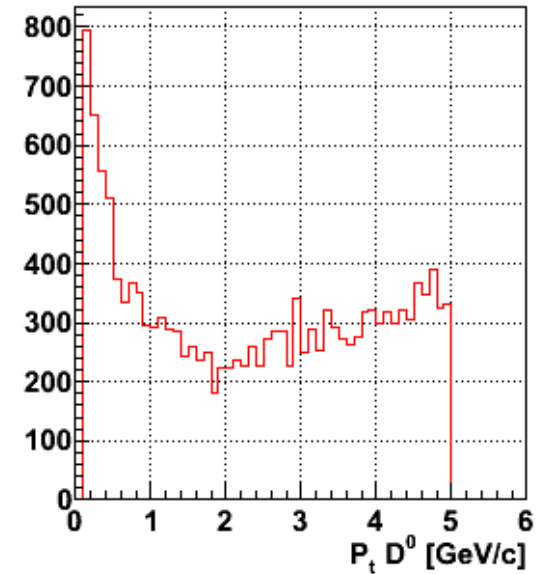
P$_t$>0.3 GeV/c,TPC>10, PIXL=2

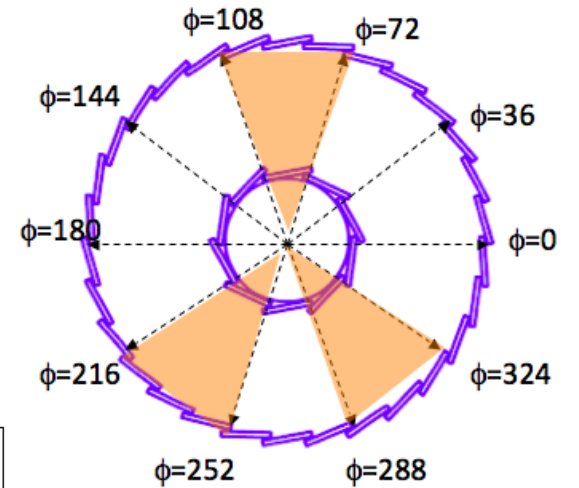P$_t$>0.3 GeV/c,TPC>10, PIXL=2

Cut : $|\eta|<1$, Pt>0.8, TPC>10,PIXL=2
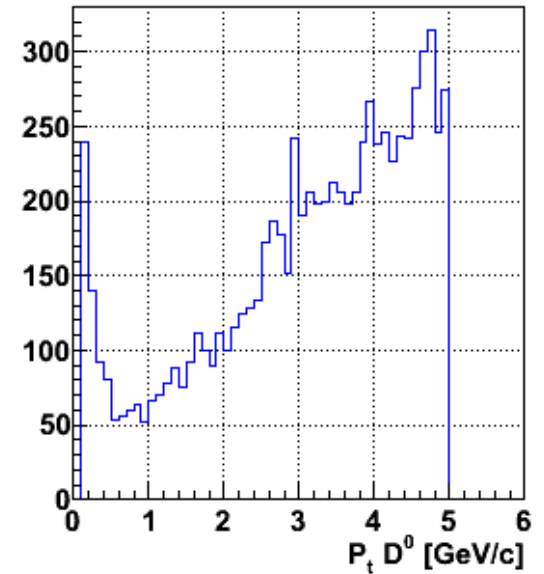
Cut :|η|<1, TPC>10,PIXL=2 : comparison
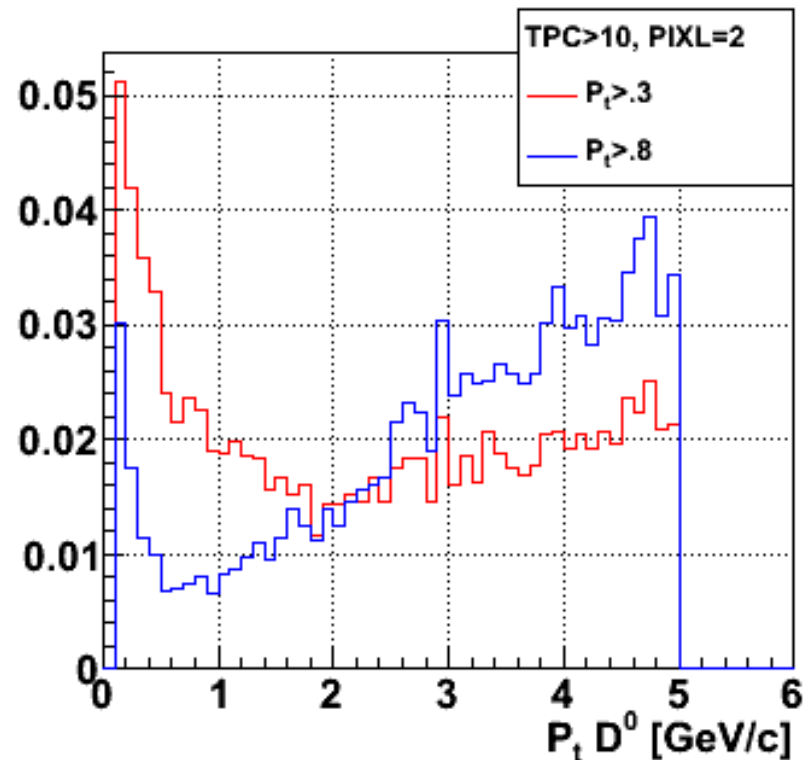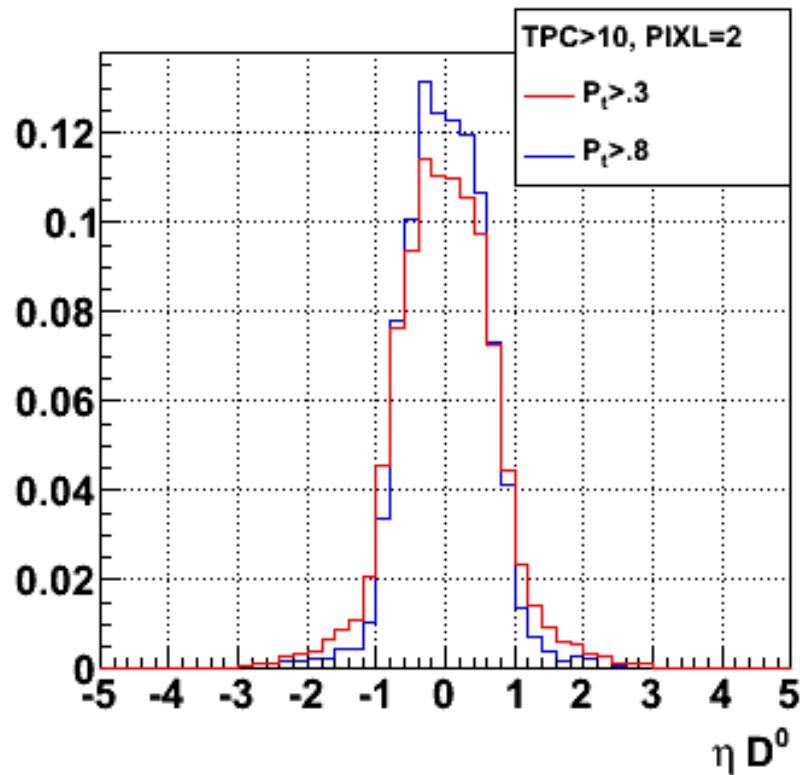
- η and Pt distributions have similar shapes than in slide 7.

- TPC and PIXEL hits cuts just gives a "usable" number of D^0's for this study (same cuts are applied in BFC reconstruction), it does not change the kinematics of the D^0's.
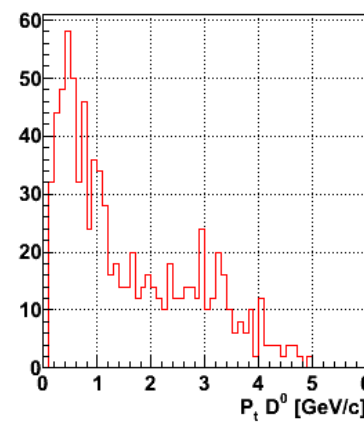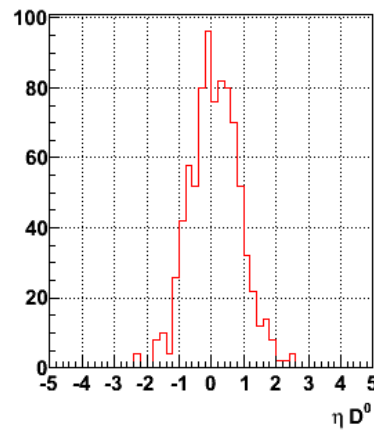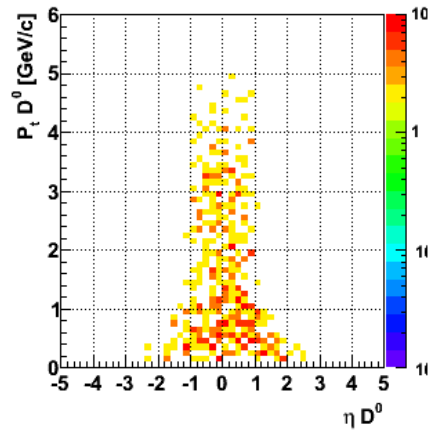
Cut :|η|<1, TPC>10,PIXL=2, patch=triangle

φ=108 φ=72
φ=144 φ=36
φ=180 φ=0
φ=216 φ=324
φ=252 φ=288

P$_t$(daughters)>.3

P$_t$(daughters)>.8

P$_t$>0.3 GeV/c,TPC>10, PIXL=2,triangle

P$_t$>0.3 GeV/c,TPC>10, PIXL=2,triangle

P$_t$>0.3 GeV/c,TPC>10, PIXL=2,triangle

P$_t$>0.8 GeV/c,TPC>10, PIXL=2,triangle

P$_t$>0.8 GeV/c,TPC>10, PIXL=2,triangle

P$_t$>0.8 GeV/c,TPC>10, PIXL=2,triangle
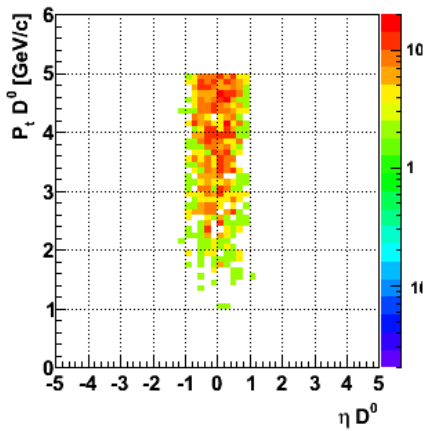
Cut :|η|<1, TPC>10,PIXL=2, patch=triangle, comparison
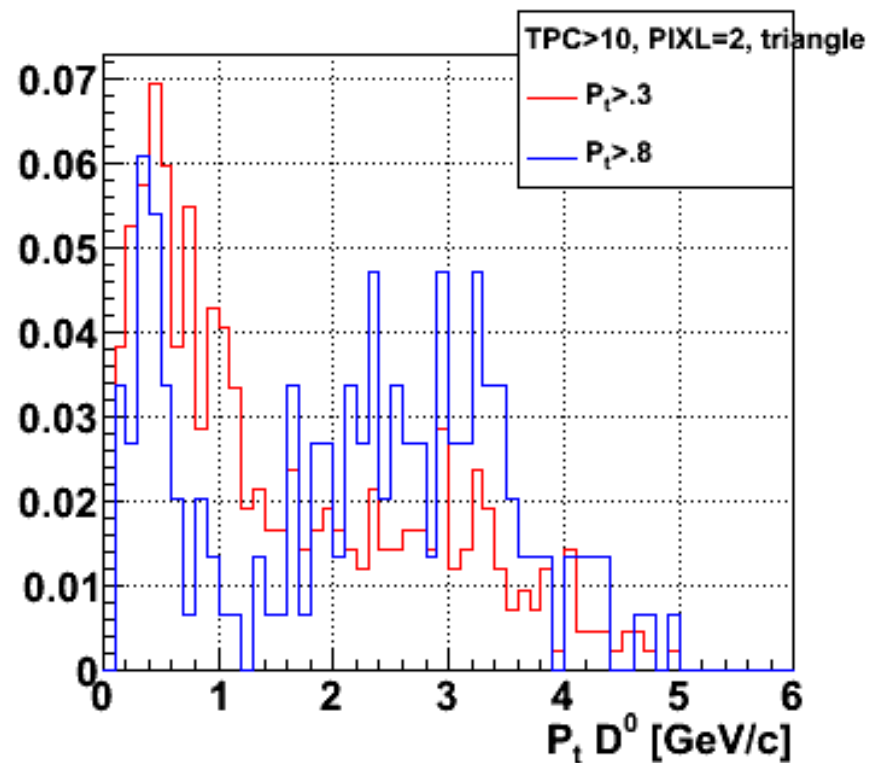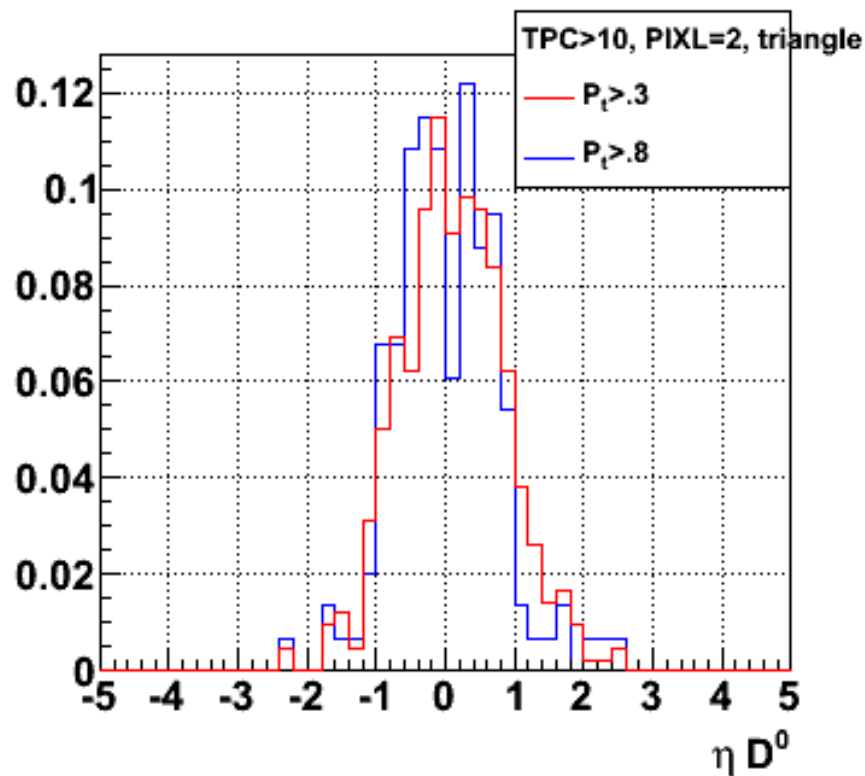
• The cut at Pt>.8 removes more entries for low Pt and seems to be more efficient at intermediate Pt (2-4GeV/c) with this configuration.

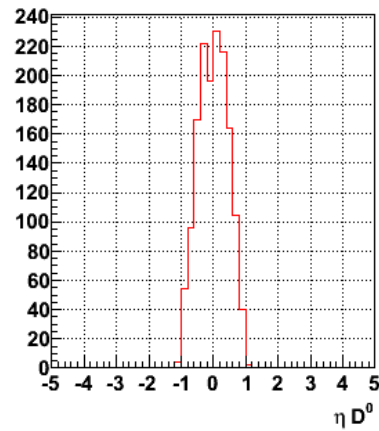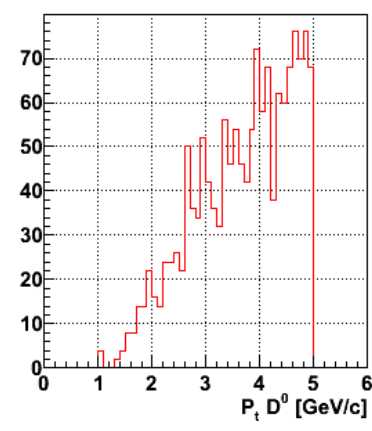# Cut :|η|<1, TPC>10,PIXL=2, patch=joined
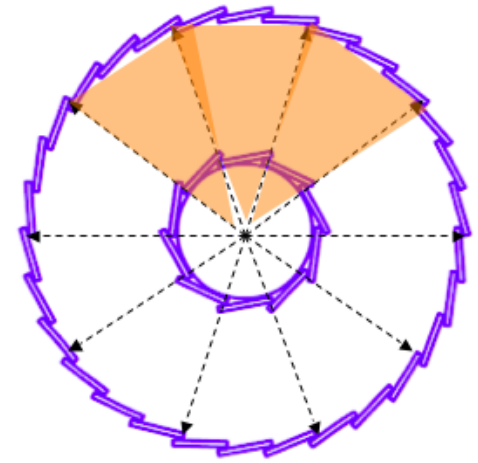
P_t>0.3 GeV/c,TPC>10, PIXL=2,joined

P_t>0.3 GeV/c,TPC>10, PIXL=2,joined

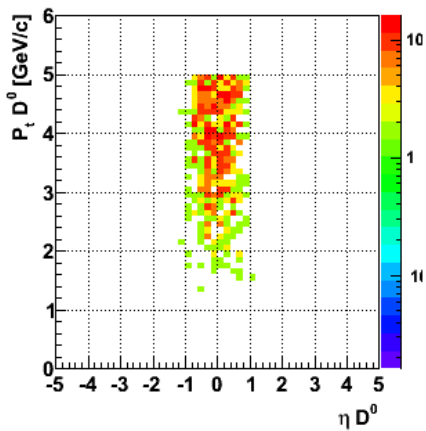P_t>0.3 GeV/c,TPC>10, PIXL=2,joined

P_t(daughters)>.3

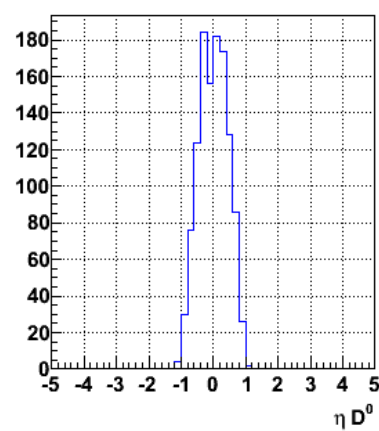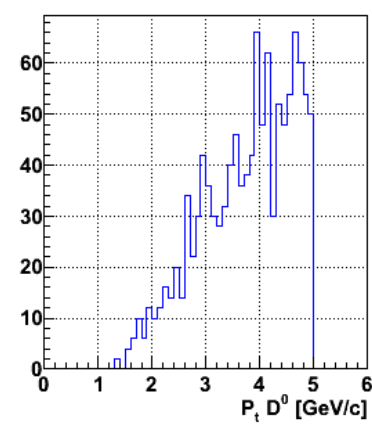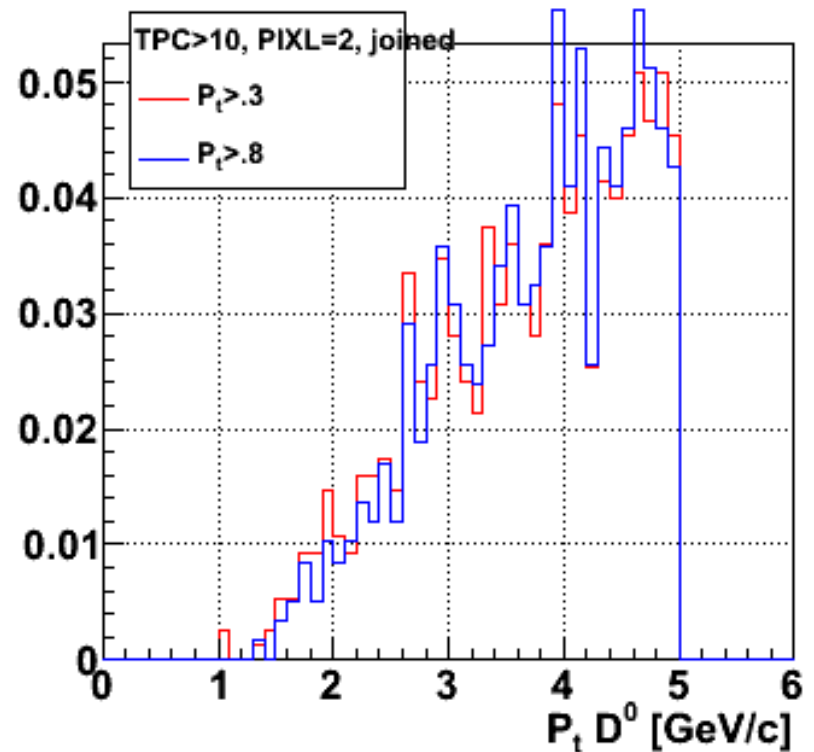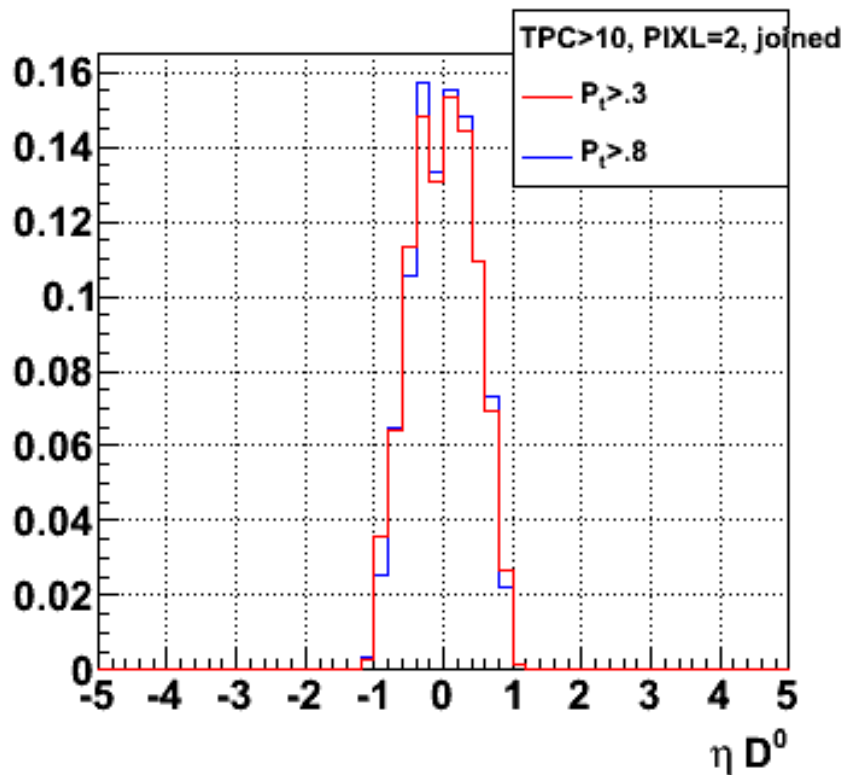P_t>0.8 GeV/c,TPC>10, PIXL=2,joined

P_t>0.8 GeV/c,TPC>10, PIXL=2,joined

P_t>0.8 GeV/c,TPC>10, PIXL=2,joined

P_t(daughters)>.8

Cut :|η|<1, TPC>10,PIXL=2, patch=joined, comparison

- The D^0's Pt distribution is not sensible to the cut on the daughters Pt with this PIXL configuration.