What is problem ?

$$\phi^{-}(E) = \frac{C^{-}(E)}{\int_V d^3\vec{r} \cdot V(\vec{r}) \cdot \epsilon^{-}(E,\vec{r})'} \qquad (34)$$

1. in-flight contamination

The nubmer of vertices includes in-flight contamination.

On the other hand $C^{-}(E)$ has little contamination due to SDD-hits requirement.

Note: a kstopID cut was already applied

2. stopped-K distribution

The distribution used for the simulation did NOT represent pure stopped-K events due to in-flight contamination

Especially, its z distribution can influence the z-dependent yield

1. in-flight contamination

To correct

Need the ratio of number of (stopped-K/in-flight)

Fit the kstopID spectra ?

Z dependence

Can reproduce the z dependence of x-ray yield ? (This couples with the stopped-K distribution)

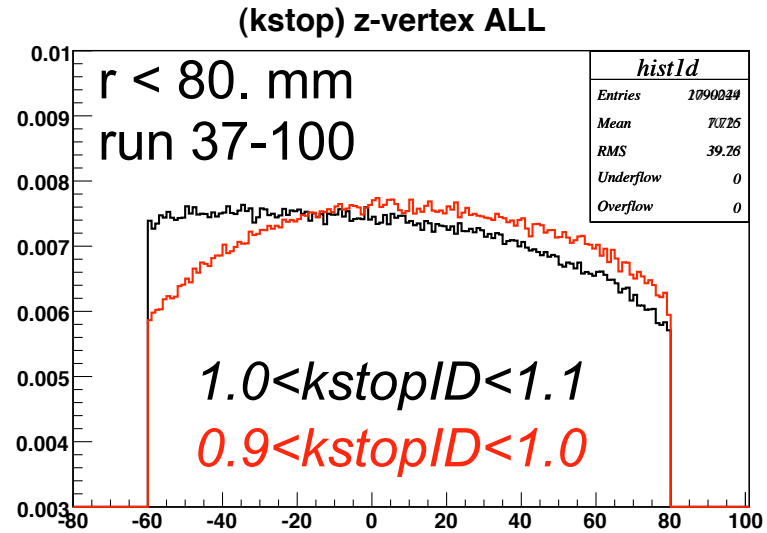
To solve ...

- Get a “pure” stopped-K distribution without any bias
  <- require the SDD hits and L-alpha
- Simulate again
- Correct the number of vertices with z dependence

2. stopped-K distribution

Need “pure” stopped-K events

In-flight contamination can be separated by a kstopID cut ?
-> No.

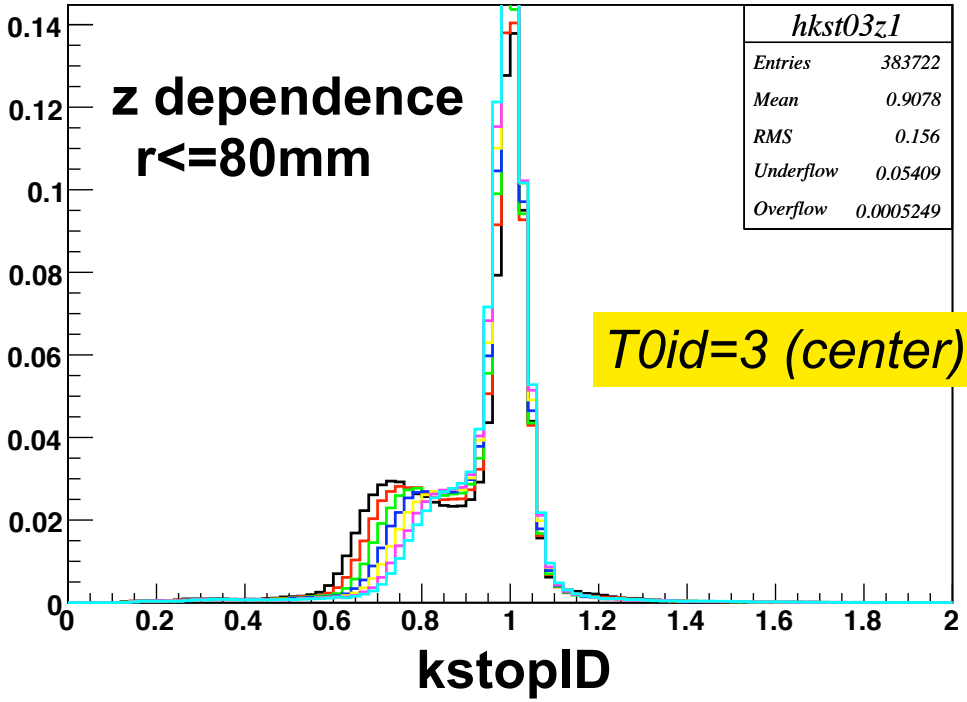


This like cut is biased !

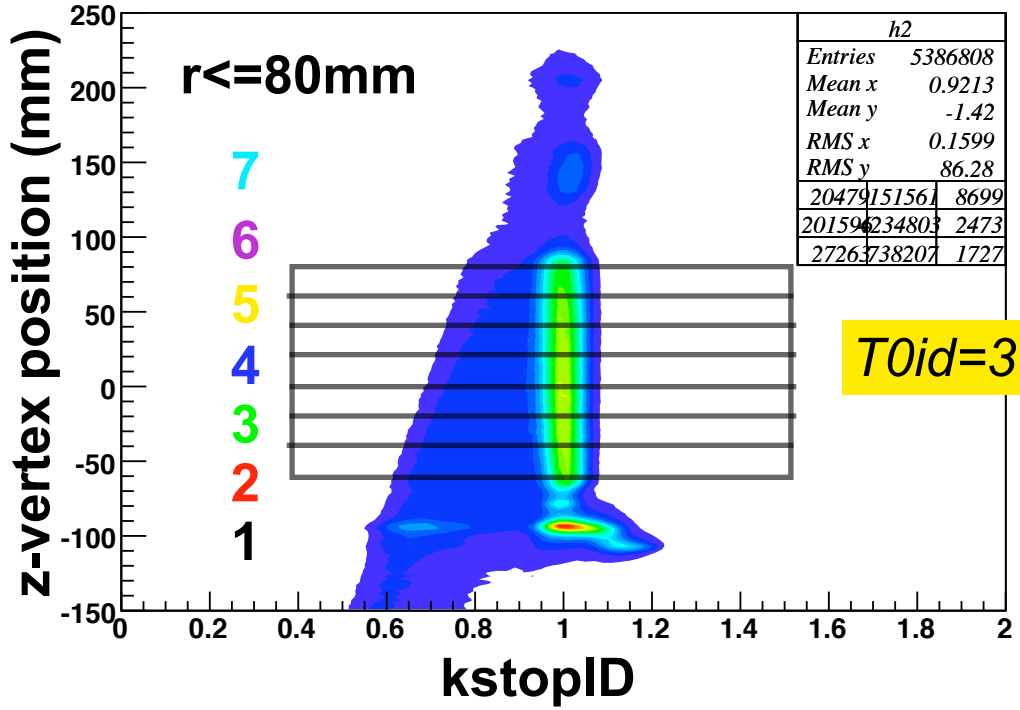
even if this distribution was used,
the yield had a dependence on the z position

→ ***z-dependent contamination ratio ?***

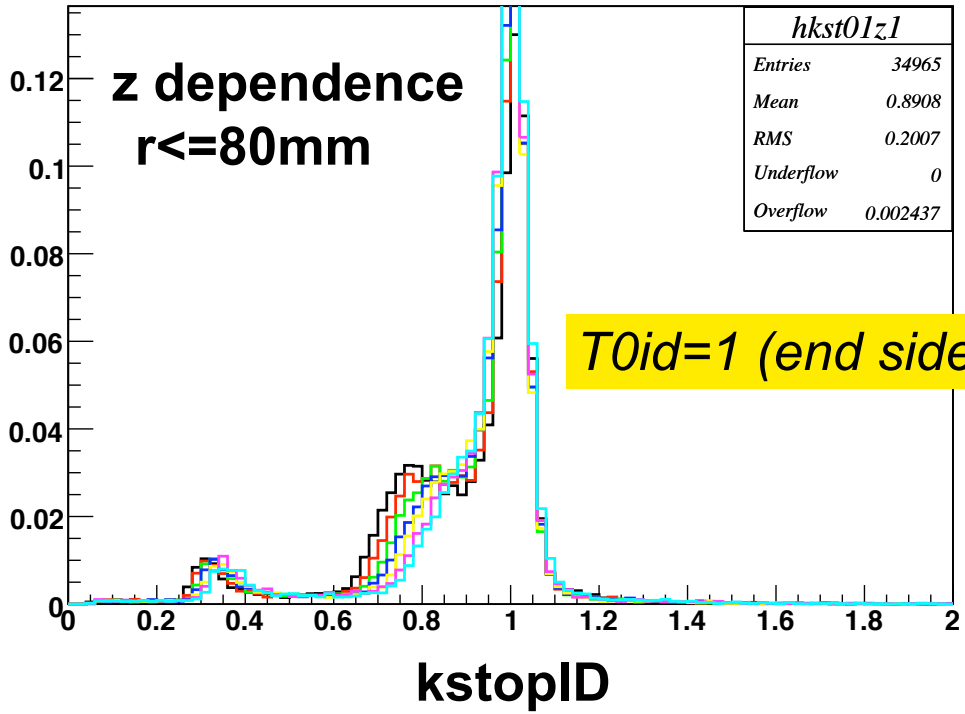
KstopID spectra run 37-100



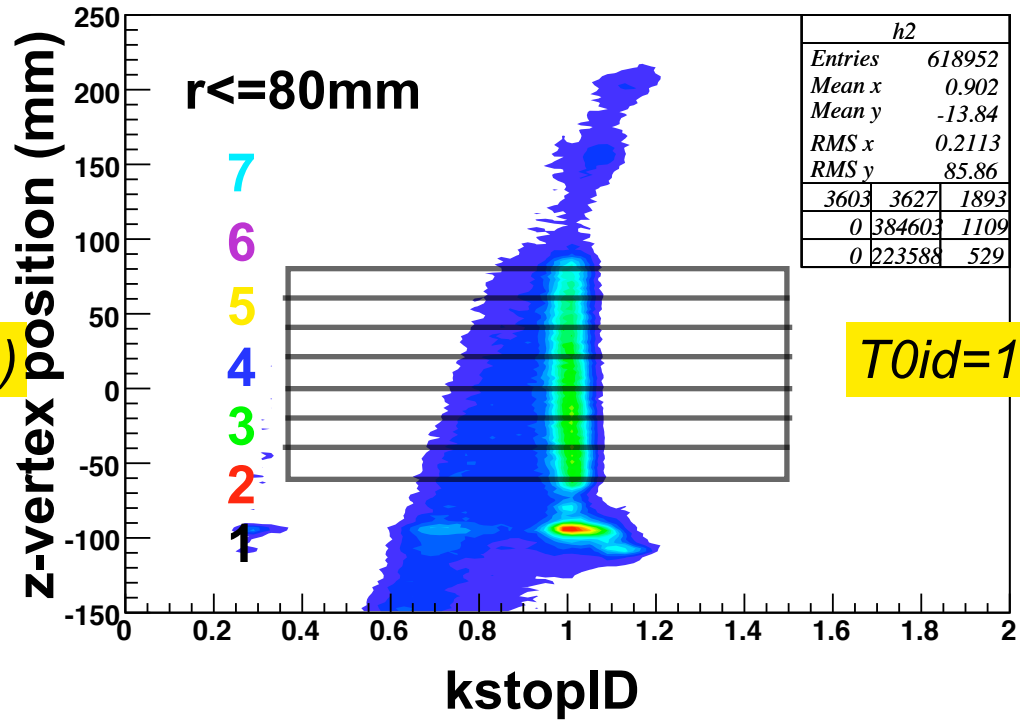
T0id=3 (center)



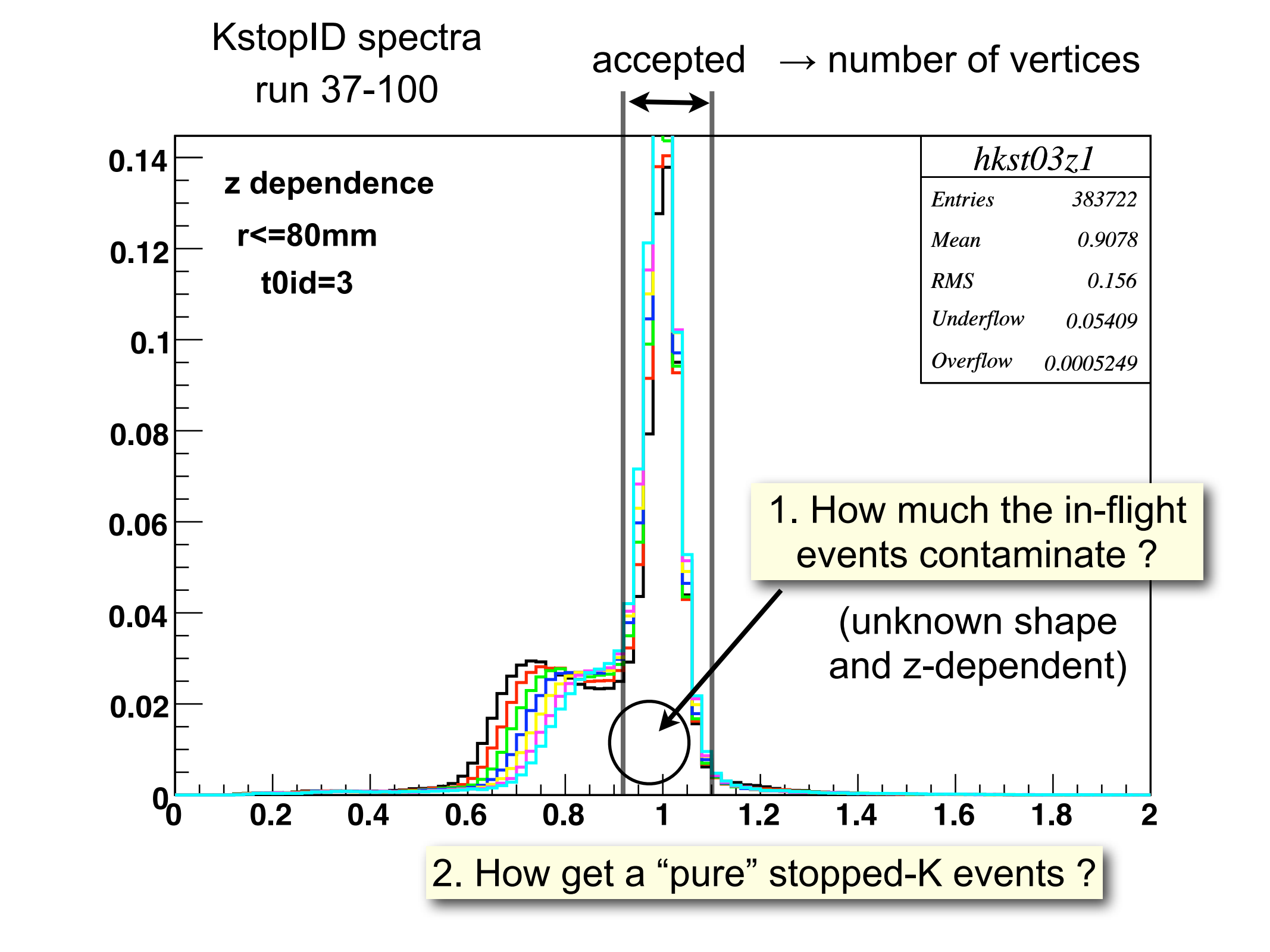
T0id=3

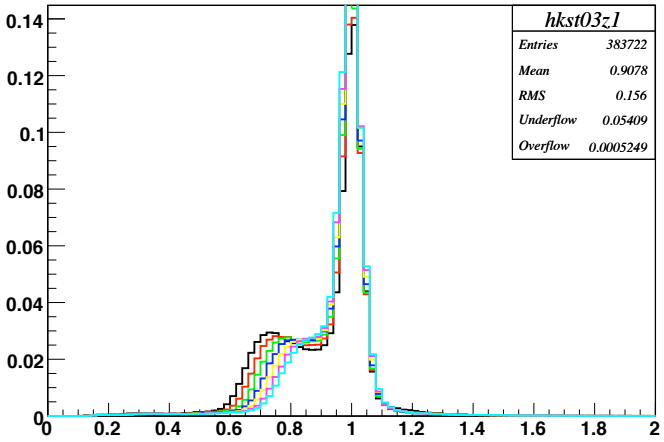


T0id=1 (end side)



T0id=1


KstopID spectra
run 37-100
accepted → number of vertices
z dependence
r<=80mm
t0id=3
hkst03z1
Entries 383722
Mean 0.9078
RMS 0.156
Underflow 0.05409
Overflow 0.0005249
0.14
0.12
0.1
0.08
0.06
0.04
0.02
0
0 0.2 0.4 0.6 0.8 1 1.2 1.4 1.6 1.8 2
1. How much the in-flight events contaminate ?
(unknown shape and z-dependent)
2. How get a “pure” stopped-K events ?



Biased z-vetex distribution

1.05<kstopID<1.10

1.00<kstopID<1.05

0.95<kstopID<1.00

0.90<kstopID<0.95