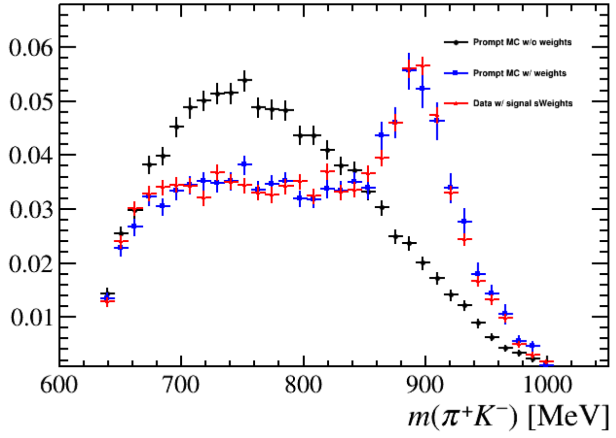
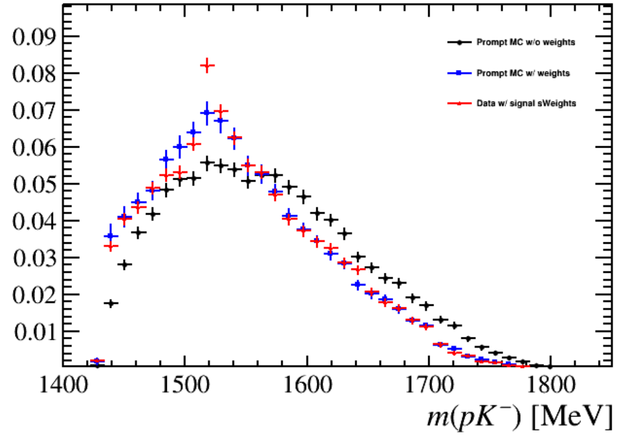
Ω_c^0 lifetime measurement

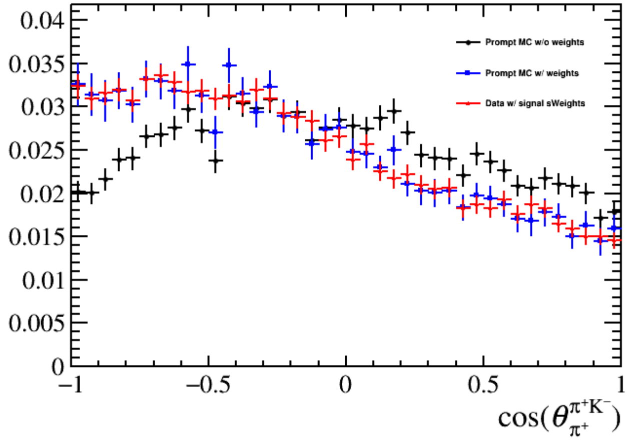
Dong Ao

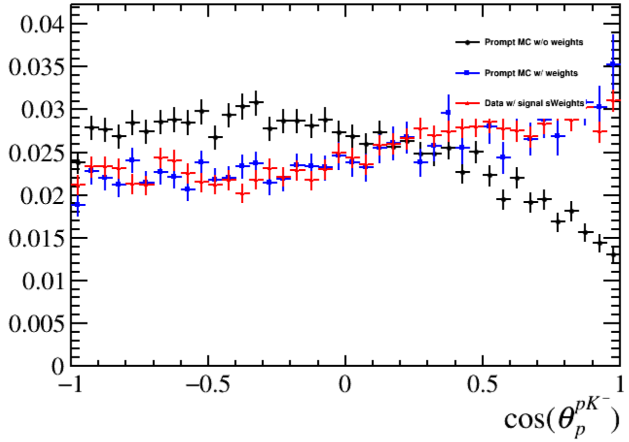
Comparison before and after corrections to MC

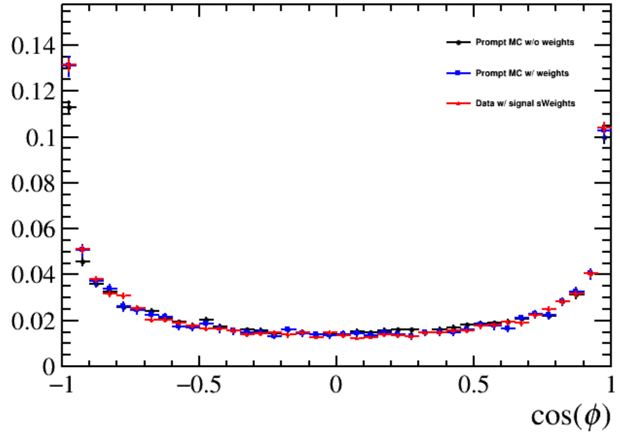
- Reweighting with GBReweighter









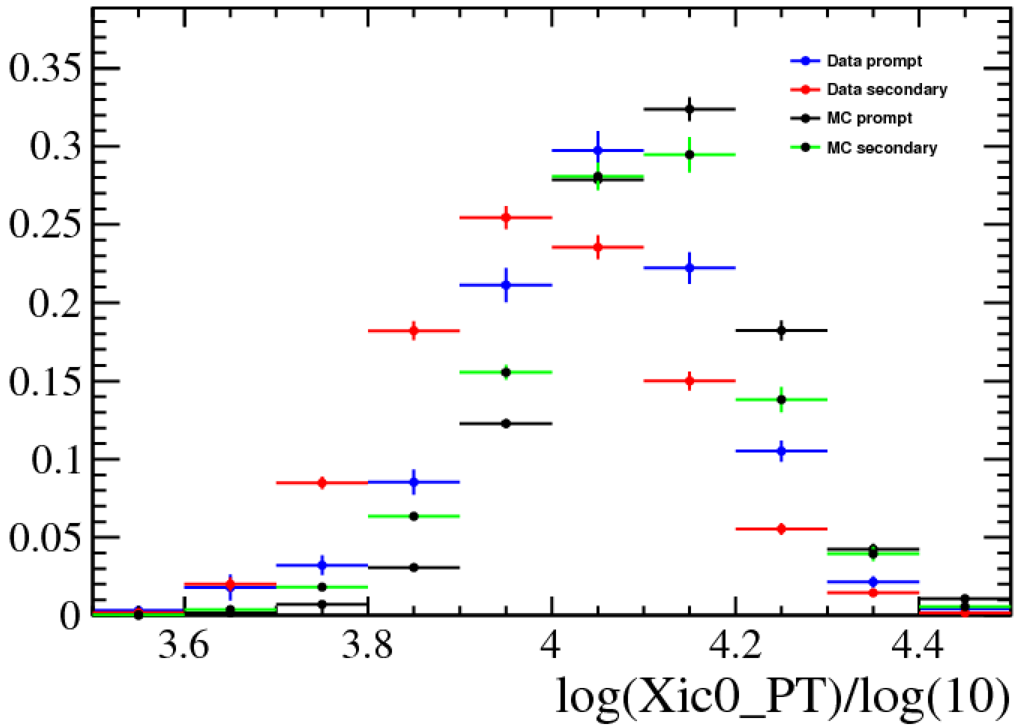


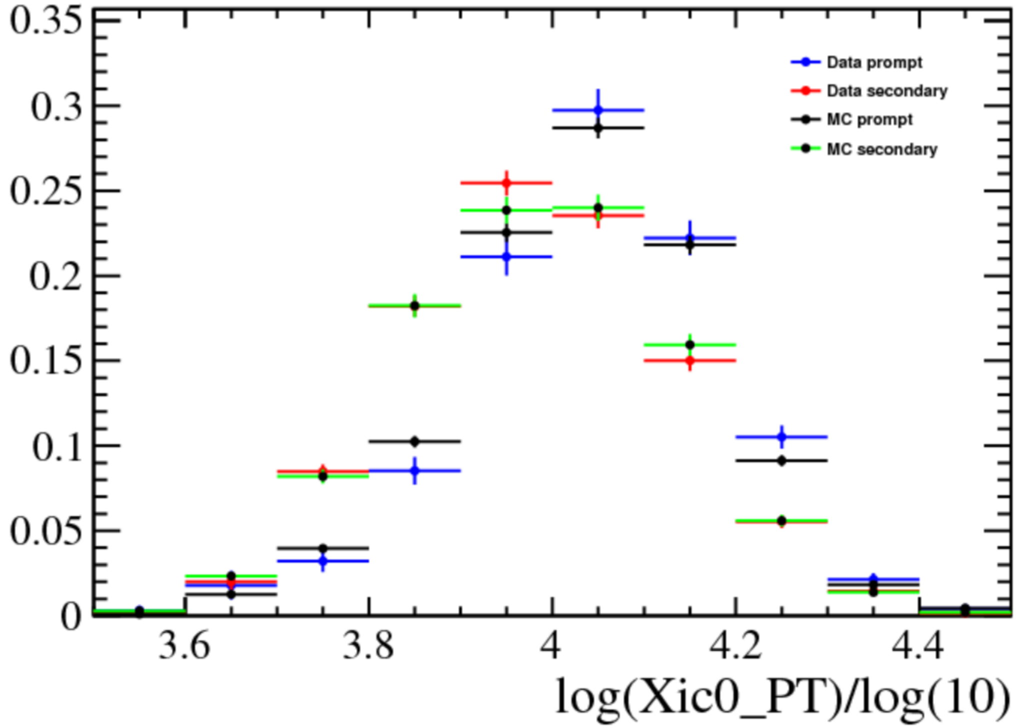
MC correction

- PIDCalib
- L0HadronTOS efficiency correction
- Reweighting with GBReweighter

Comparison of Xic0_PT

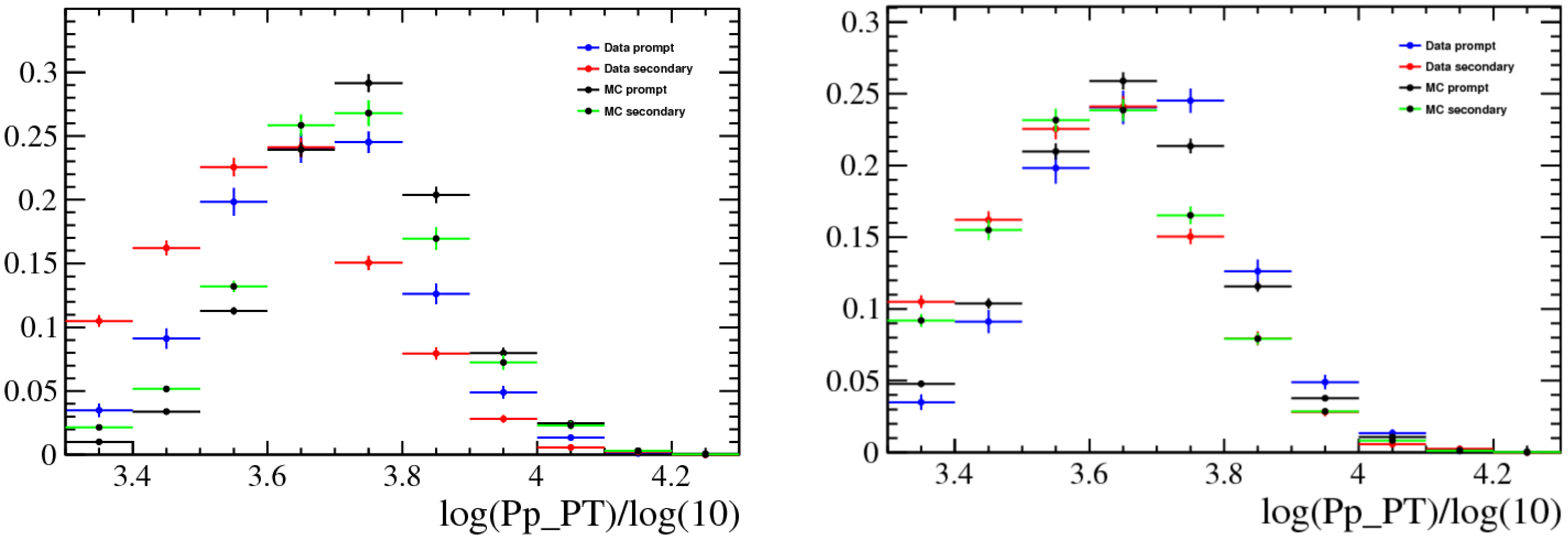
- With(left) and without(right) L0HadronTOS efficiency correction





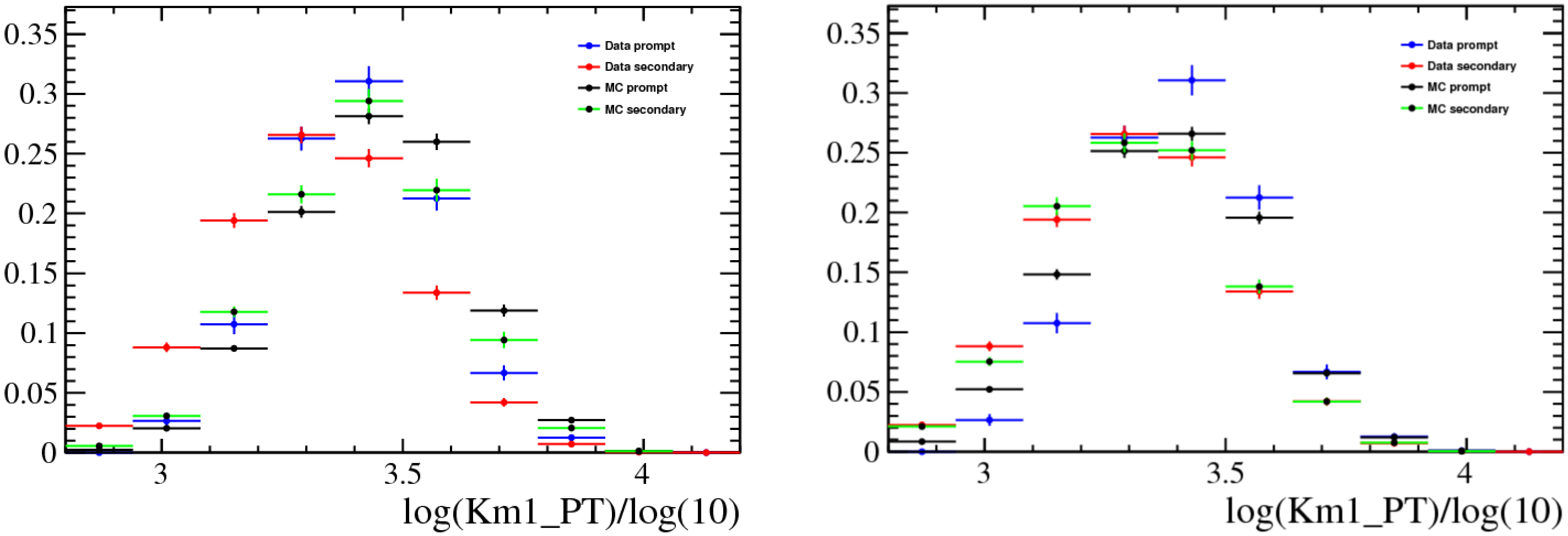
Comparison of Pp_PT

- With(left) and without(right) L0HadronTOS efficiency correction



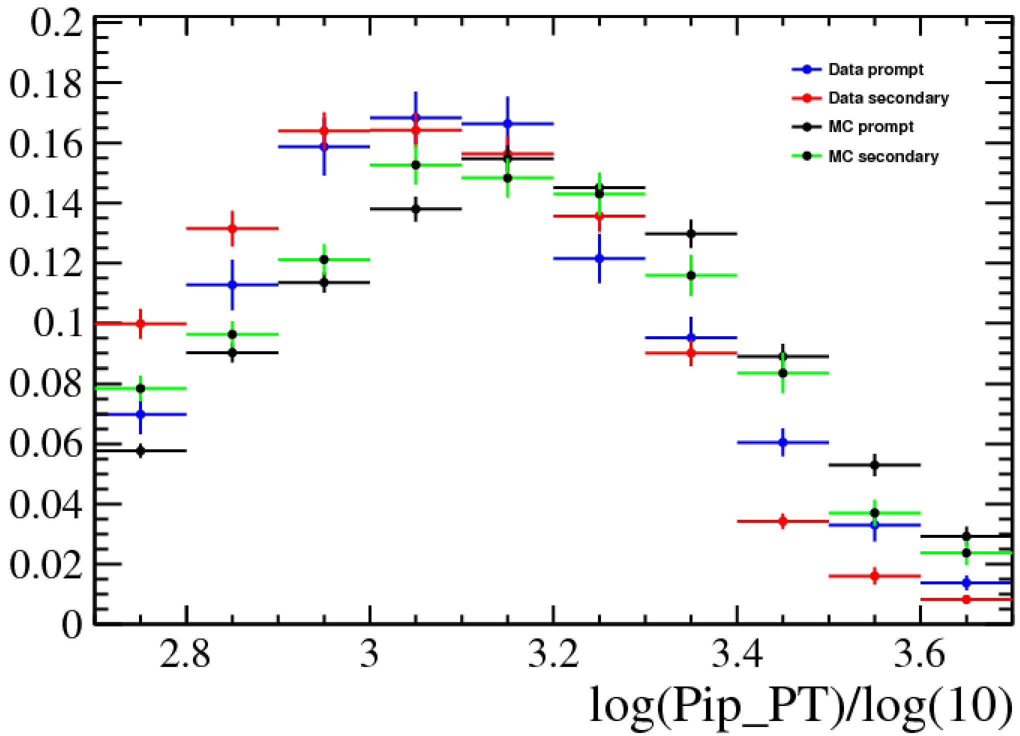
Comparison of Km_PT

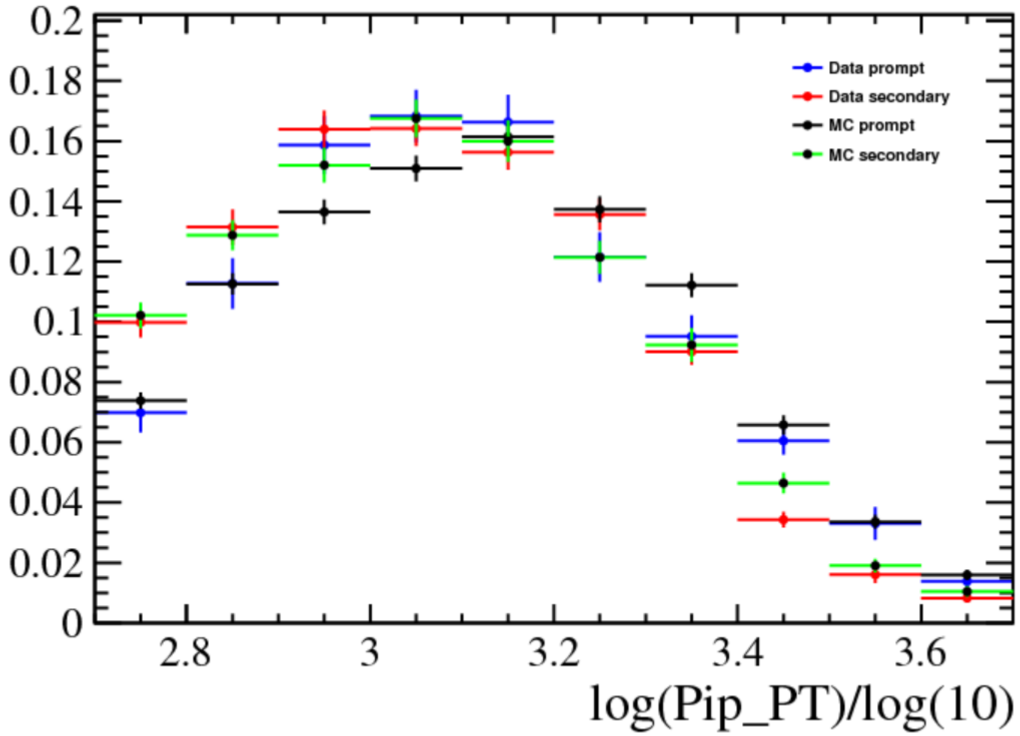
- With(left) and without(right) L0HadronTOS efficiency correction



Comparison of Pip_PT

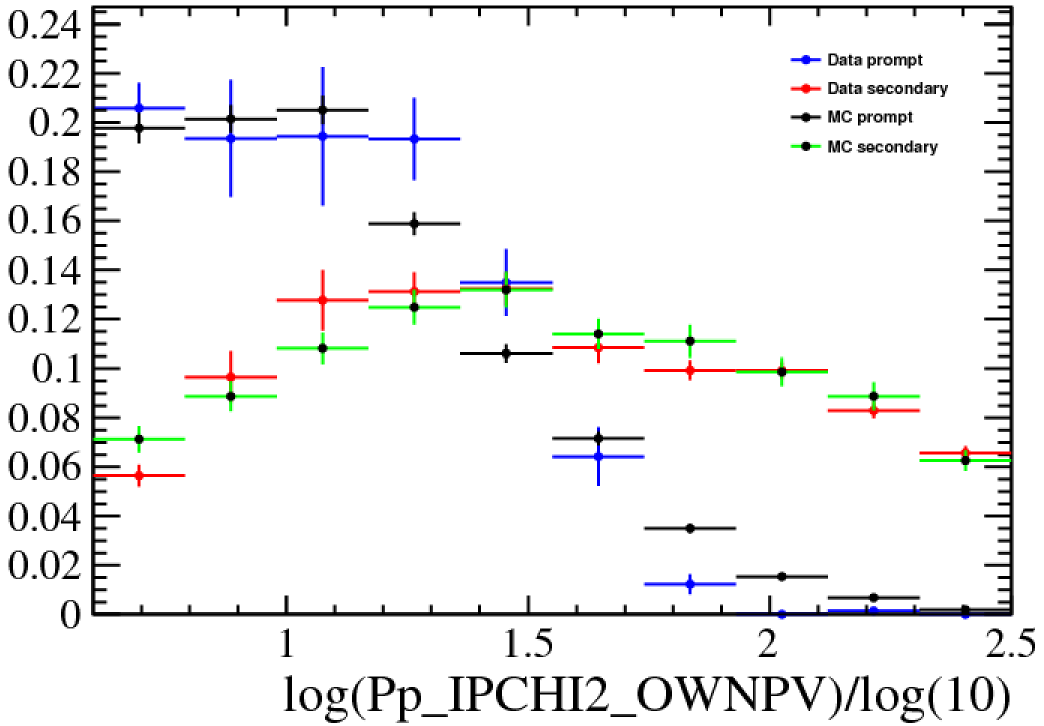
- With(left) and without(right) L0HadronTOS efficiency correction

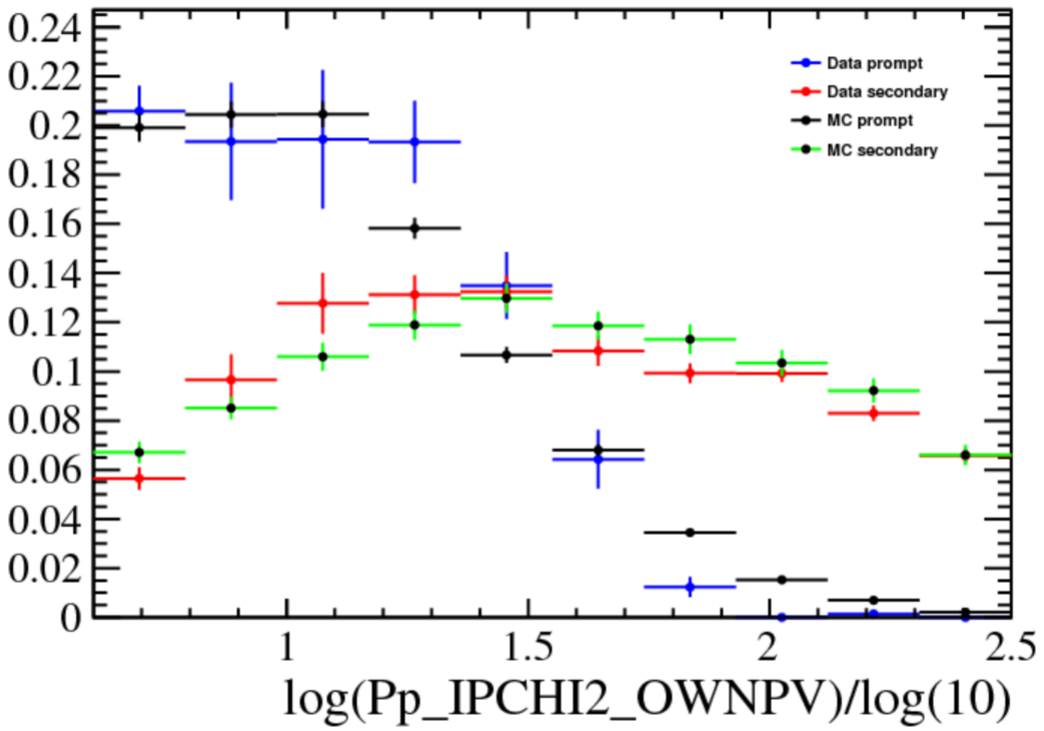




Comparison of Pp_IPCHI2

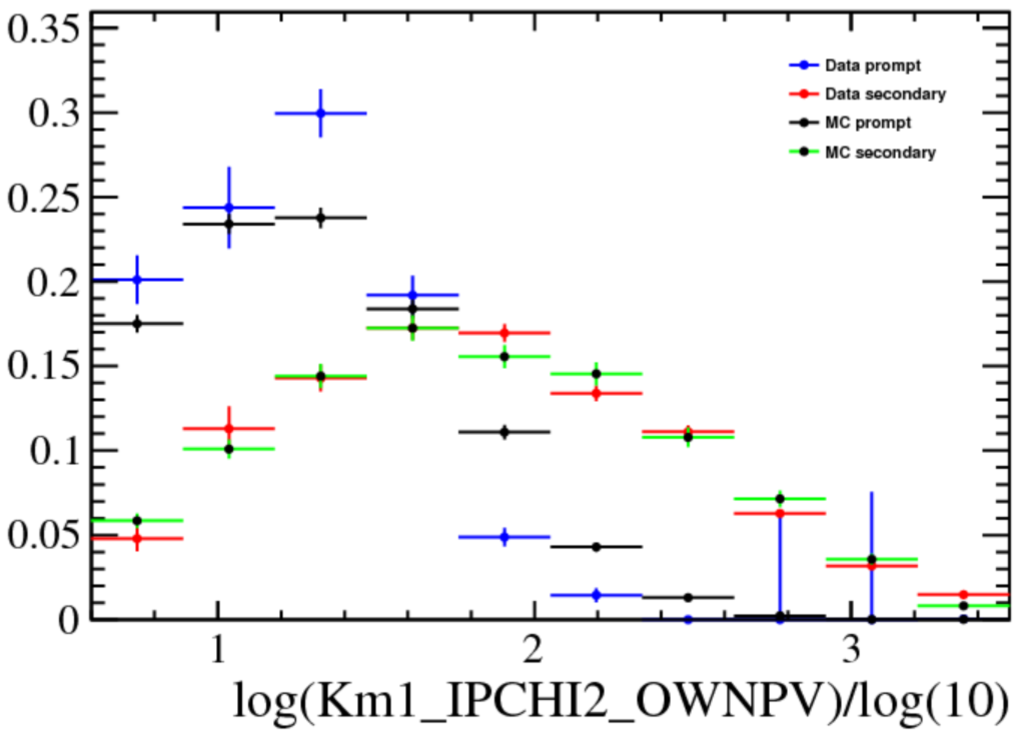
- With(left) and without(right) L0HadronTOS efficiency correction

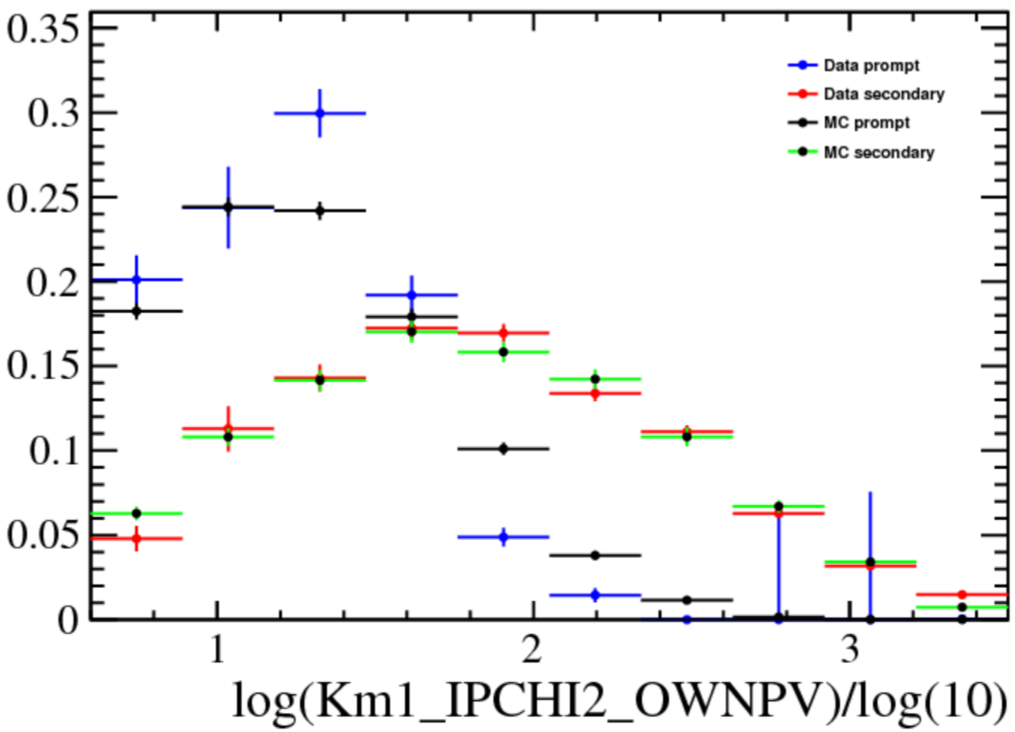




Comparison of Km_IPCHI2

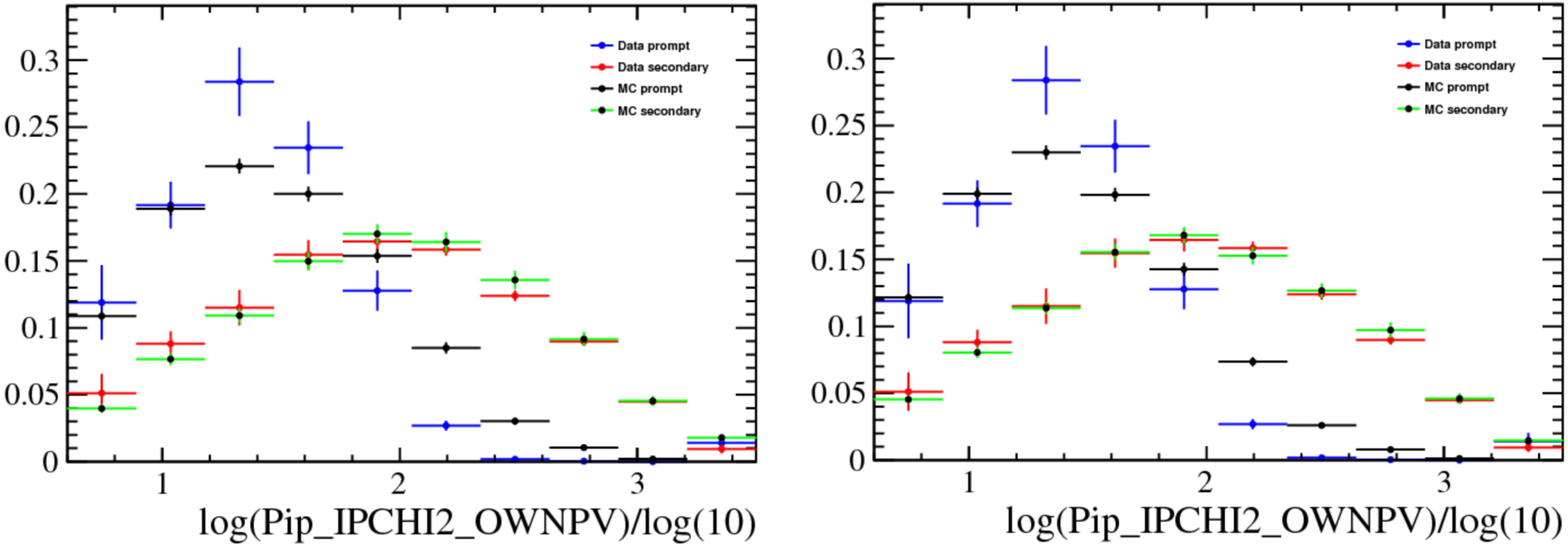
- With(left) and without(right) L0HadronTOS efficiency correction





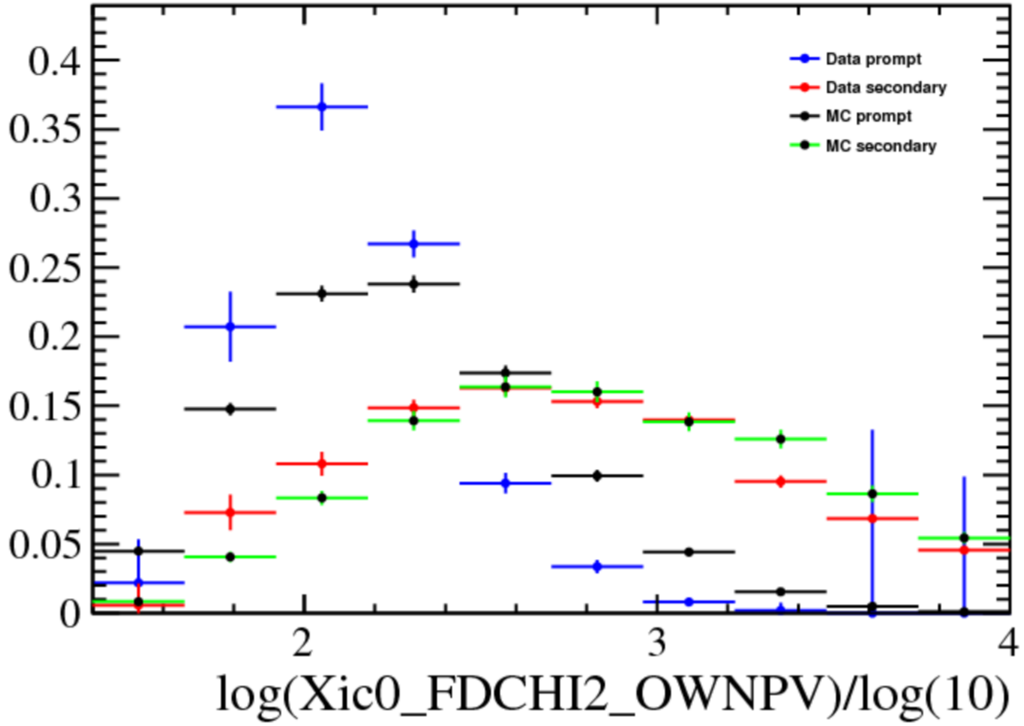
Comparison of Pip_IPCHI2

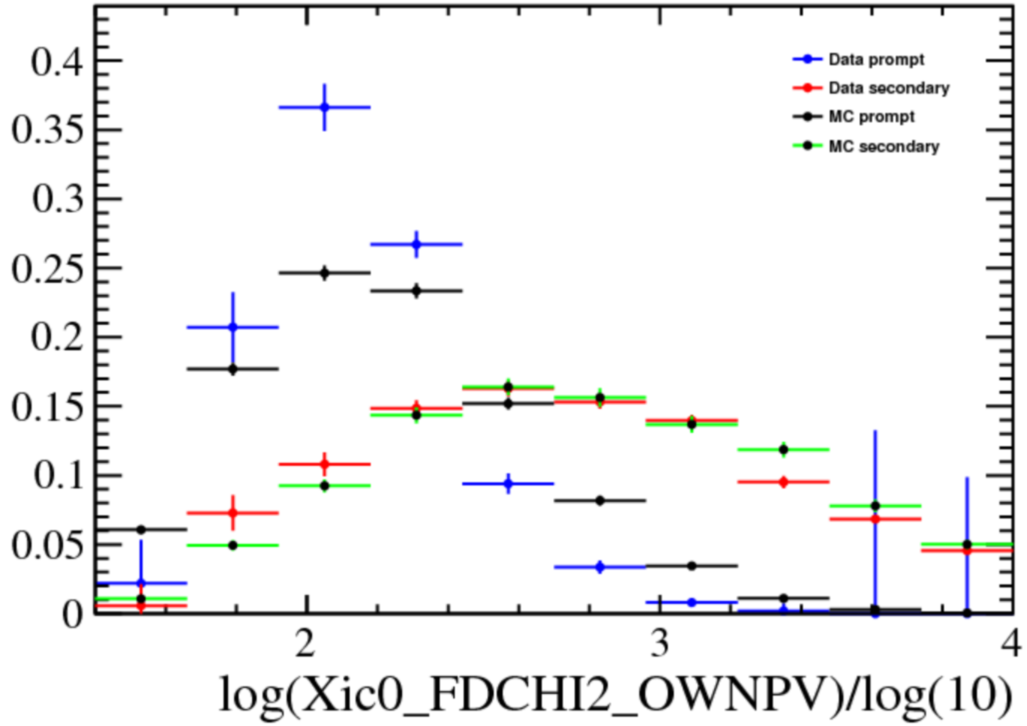
- With(left) and without(right) L0HadronTOS efficiency correction



Comparison of Xic0_FDCHI2

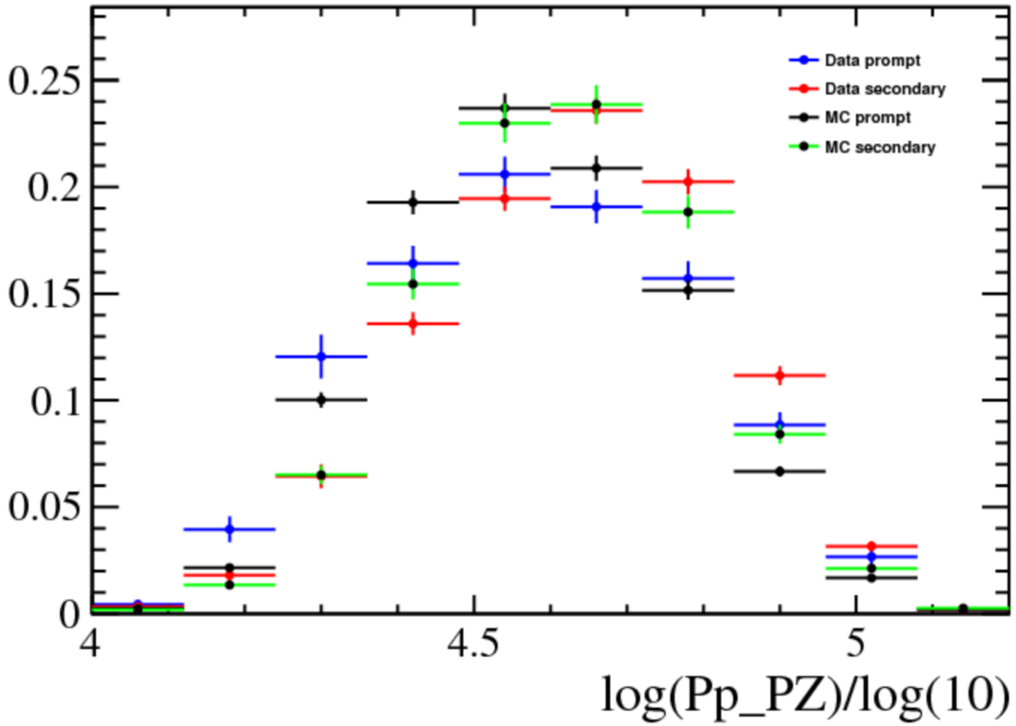
- With(left) and without(right) L0HadronTOS efficiency correction

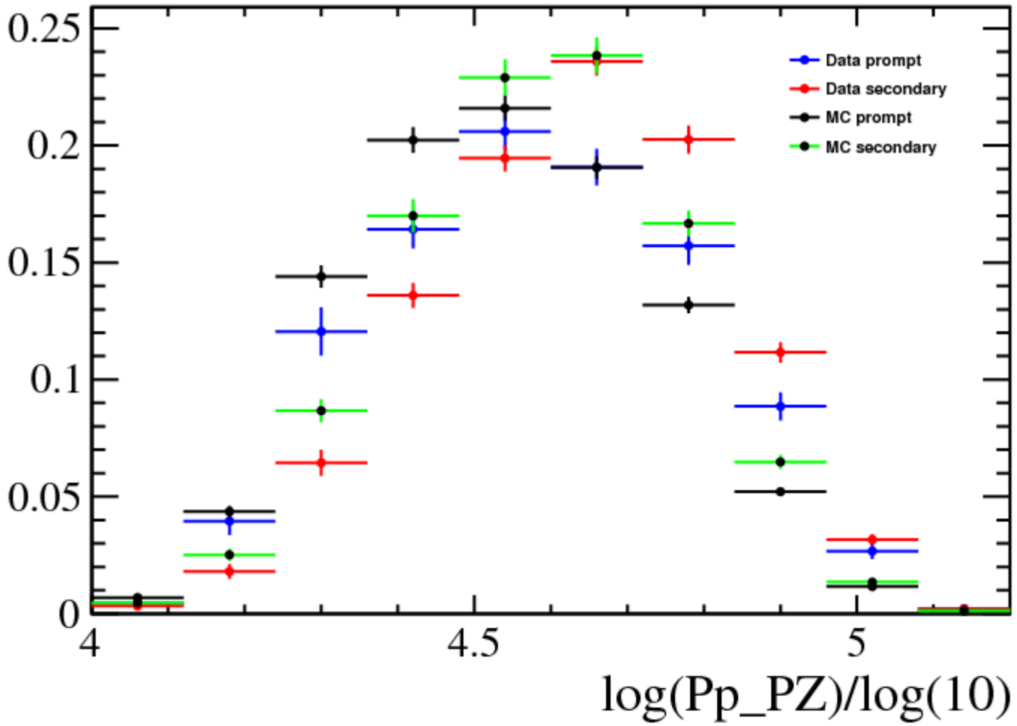




Comparison of Pp_PZ

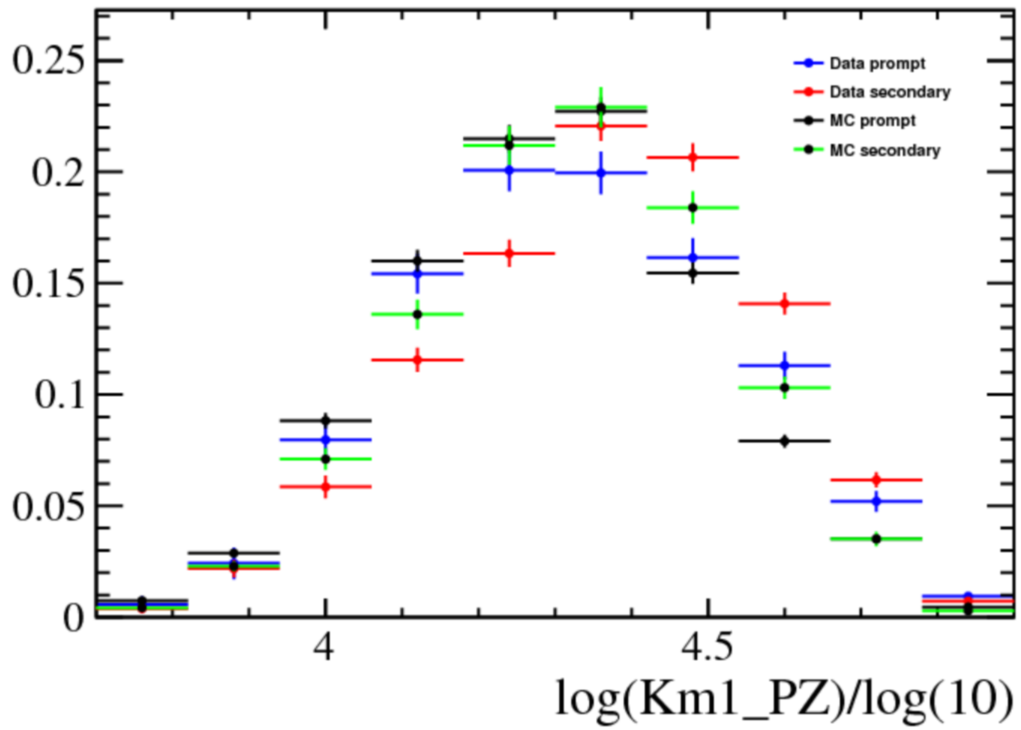
- With(left) and without(right) L0HadronTOS efficiency correction

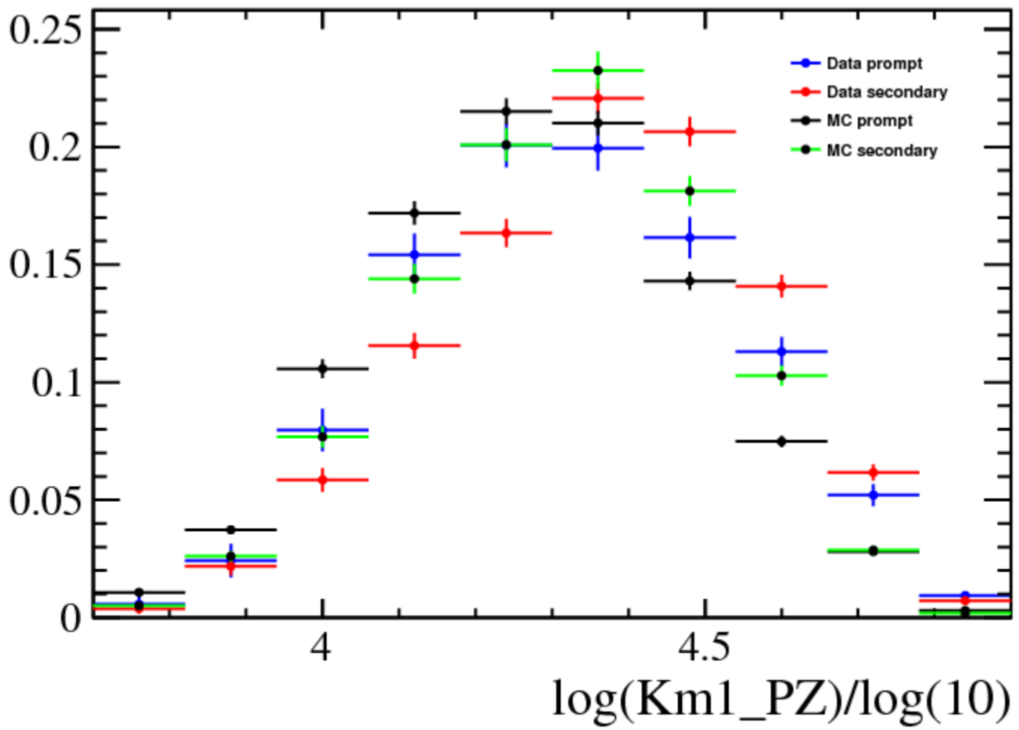




Comparison of Km_PZ

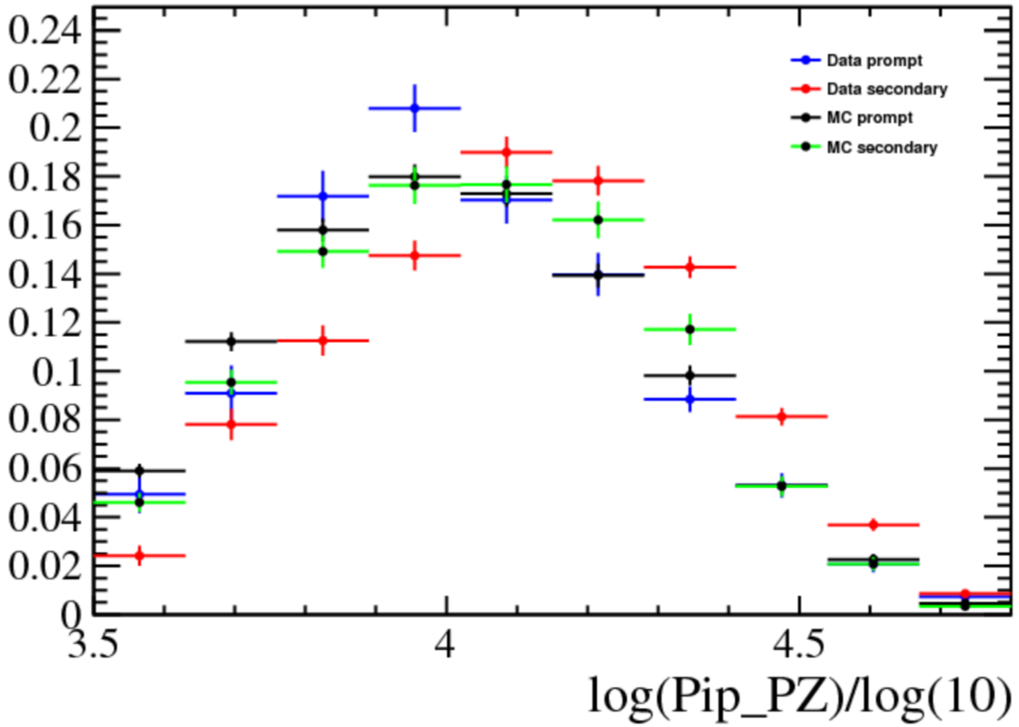
- With(left) and without(right) L0HadronTOS efficiency correction

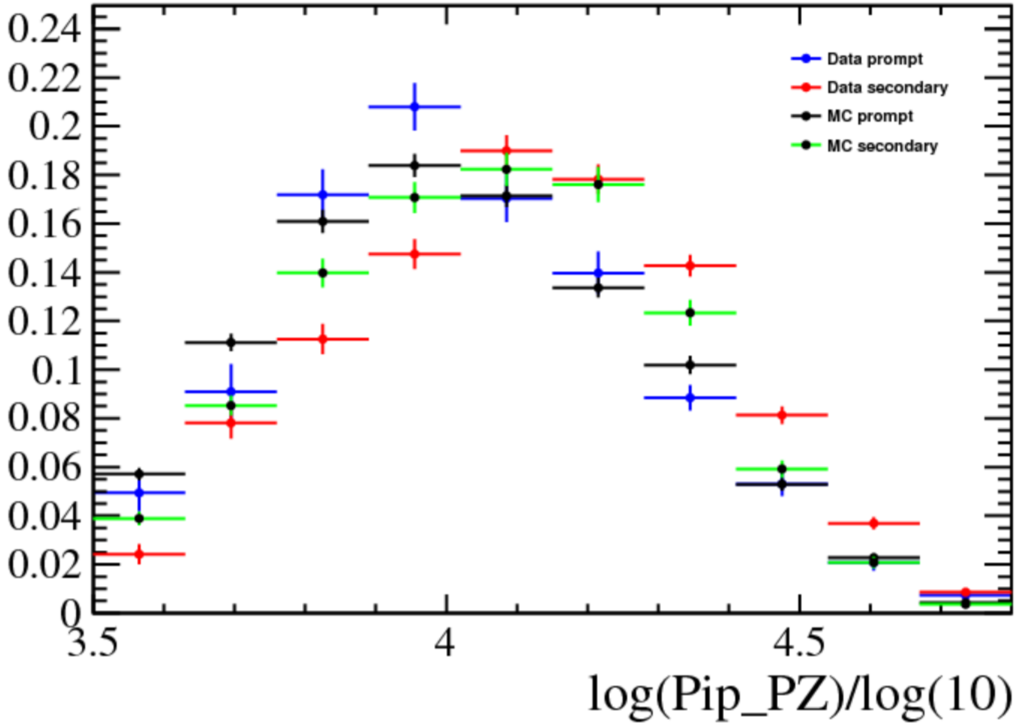




Comparison of Pip_PZ

- With(left) and without(right) L0HadronTOS efficiency correction





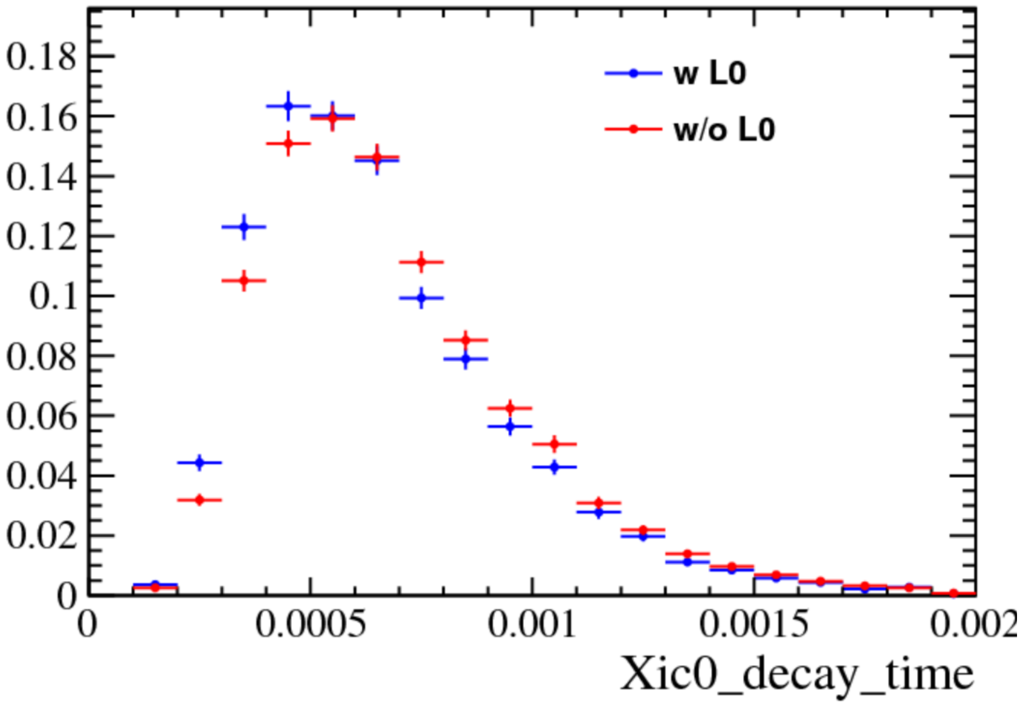
Comparison

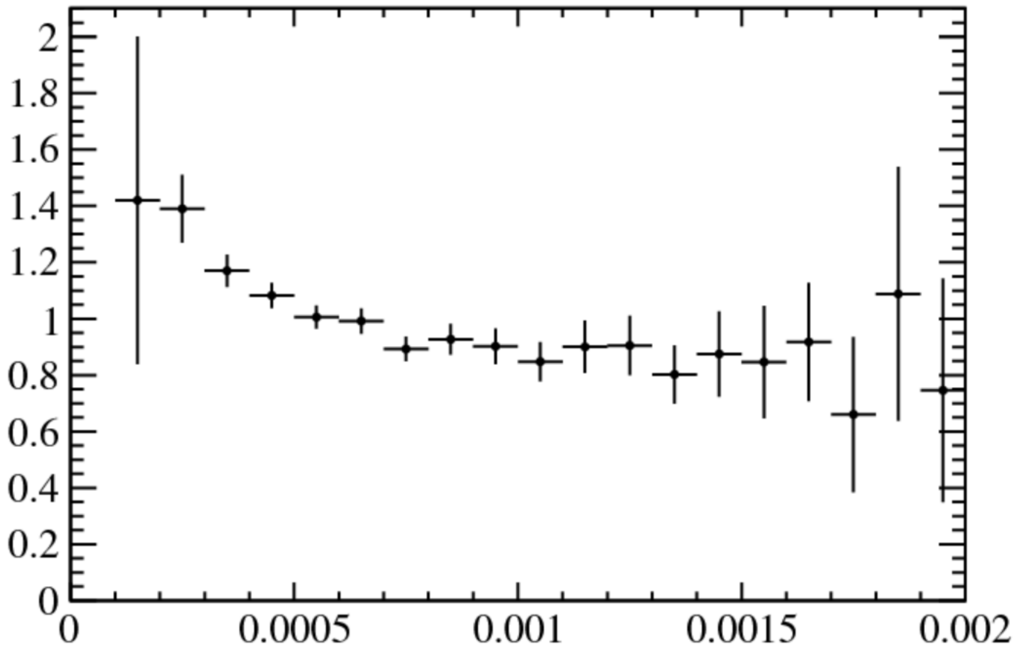
- Seems
- L0HadronTOS efficiency correction
  - may cause PT disagreement
  - have very small effect on other variables

- Xic0_FDCHI2 and daughter IPCHI2 agree well in secondary samples

Xic0 MC($\tau = 250\ fs$)

- Decaytime distribution with and without L0 calibration(left)
- Ratio between them (with L0/no L0)
- Can this effect be canceled by ratio between Ω_c^0 and Ξ_c^0?





About tau fit

LHCb-ANA-2016-068
March 7, 2017
Final version

Measurement of the decay-width difference between the B_s^0 and B^0 mesons and the D_s and D mesons

A binned least-squares fit is used to extract $\Delta(D)$, by minimizing

$$\chi^2 = \sum_i^{\text{bins}} \frac{(n_i - R_i d_i)^2}{\sigma_{n_i}^2 + R_i^2 \sigma_{d_i}^2}, \tag{8}$$

where n_i (d_i) is the yield of the numerator (denominator) in time bin i, σ_{n_i} (σ_{d_i}) its uncertainty, and R_i is the expected ratio defined as

$$R_i = N\, A_i \frac{\int_{T_i} \text{pdf}_n(t_D)\, dt_D}{\int_{T_i} \text{pdf}_d(t_D)\, dt_D}. \tag{9}$$

For the bin i, T_i is the corresponding t_D interval, A_i is the ratio between the decay-time acceptances of the numerator over the denominator, $\text{pdf}_{n(d)}$ is the pdf of the numerator (denominator), and N a normalisation factor. The integral over t is done numerically with 100 steps per decay-time bin. Each pdf is written as

$$\text{pdf}_j(t) = e^{-\Gamma_j t_D} \otimes \mathcal{G}_j^{\text{res}} \qquad (j = n, d), \tag{10}$$

About tau fit

- Expected ratio in bins
- $R_i = NA_i \frac{\int_{T_i} pdf_n(t)dt}{\int_{T_i} pdf_d(t)dt}$
- Fit with step function or use self designed χ^2 like last page?