



# Status Report

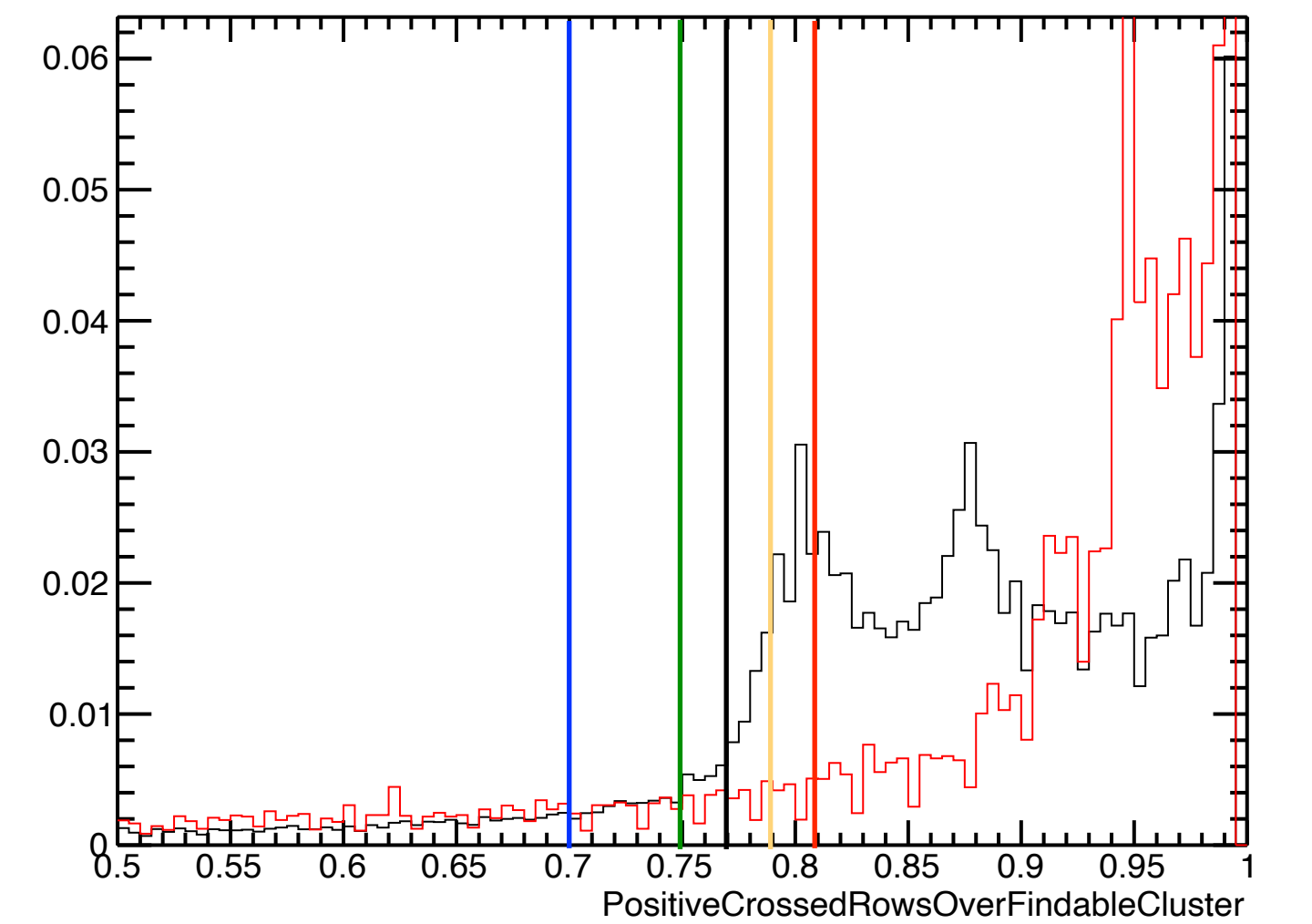
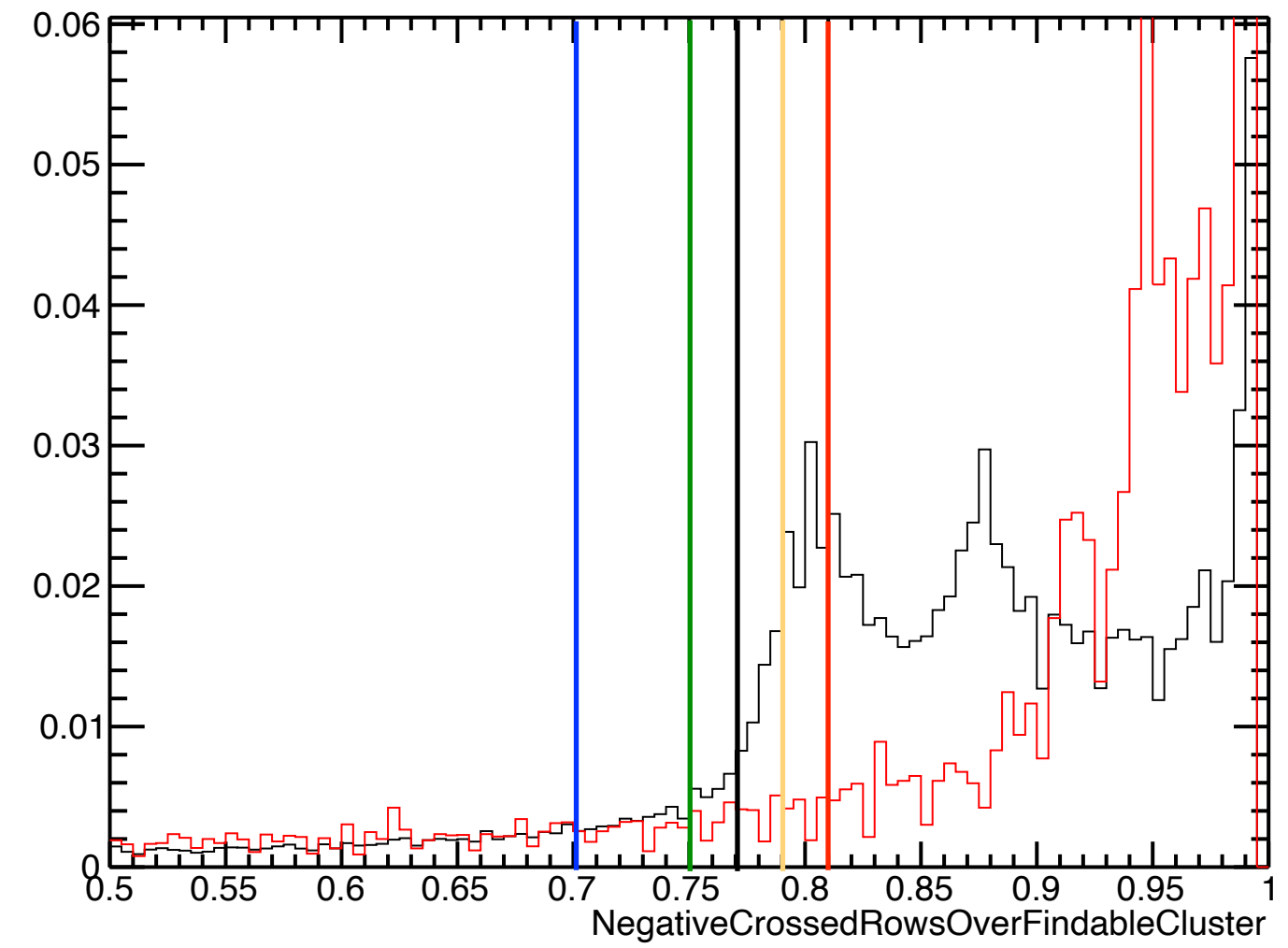
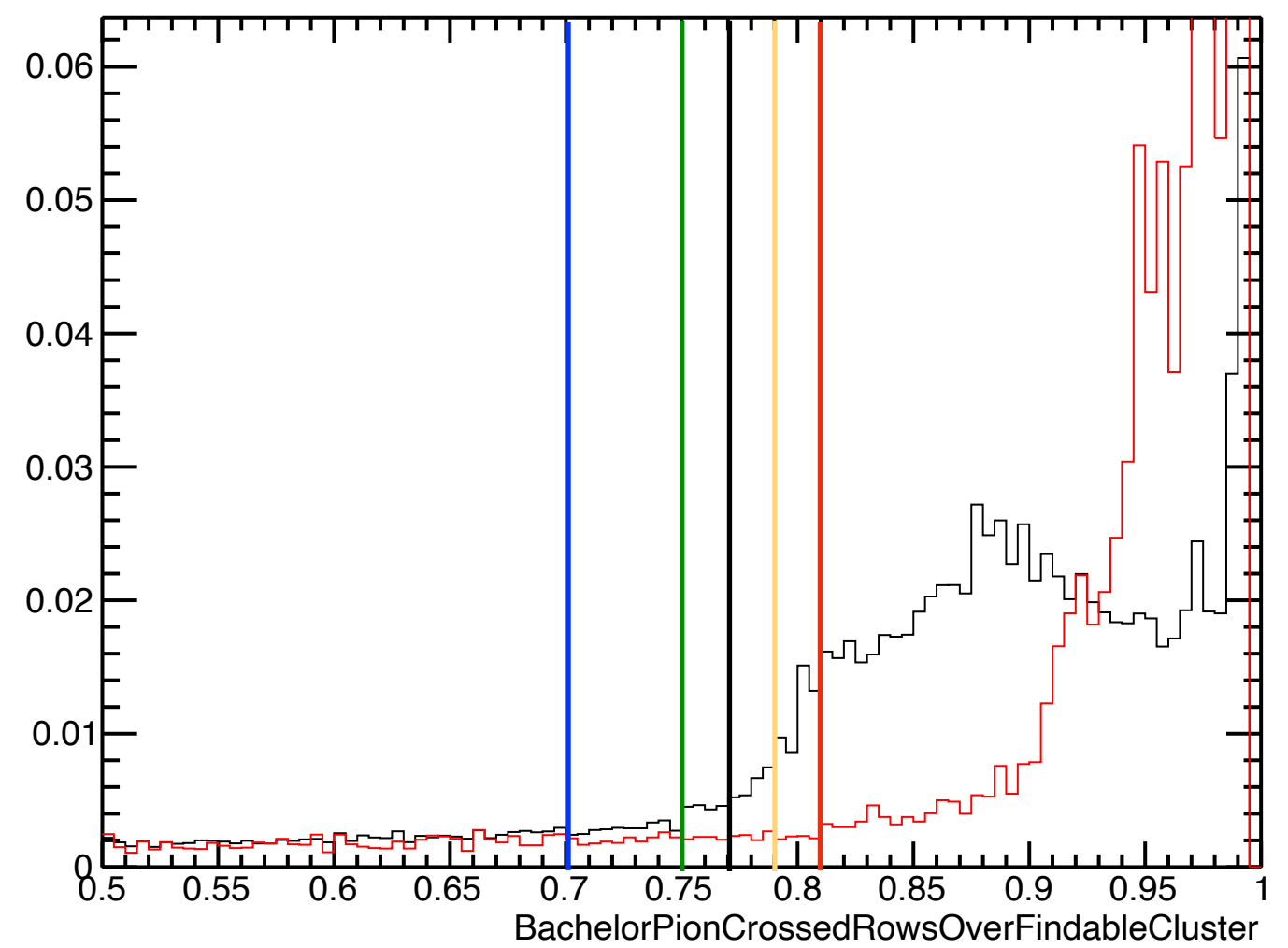
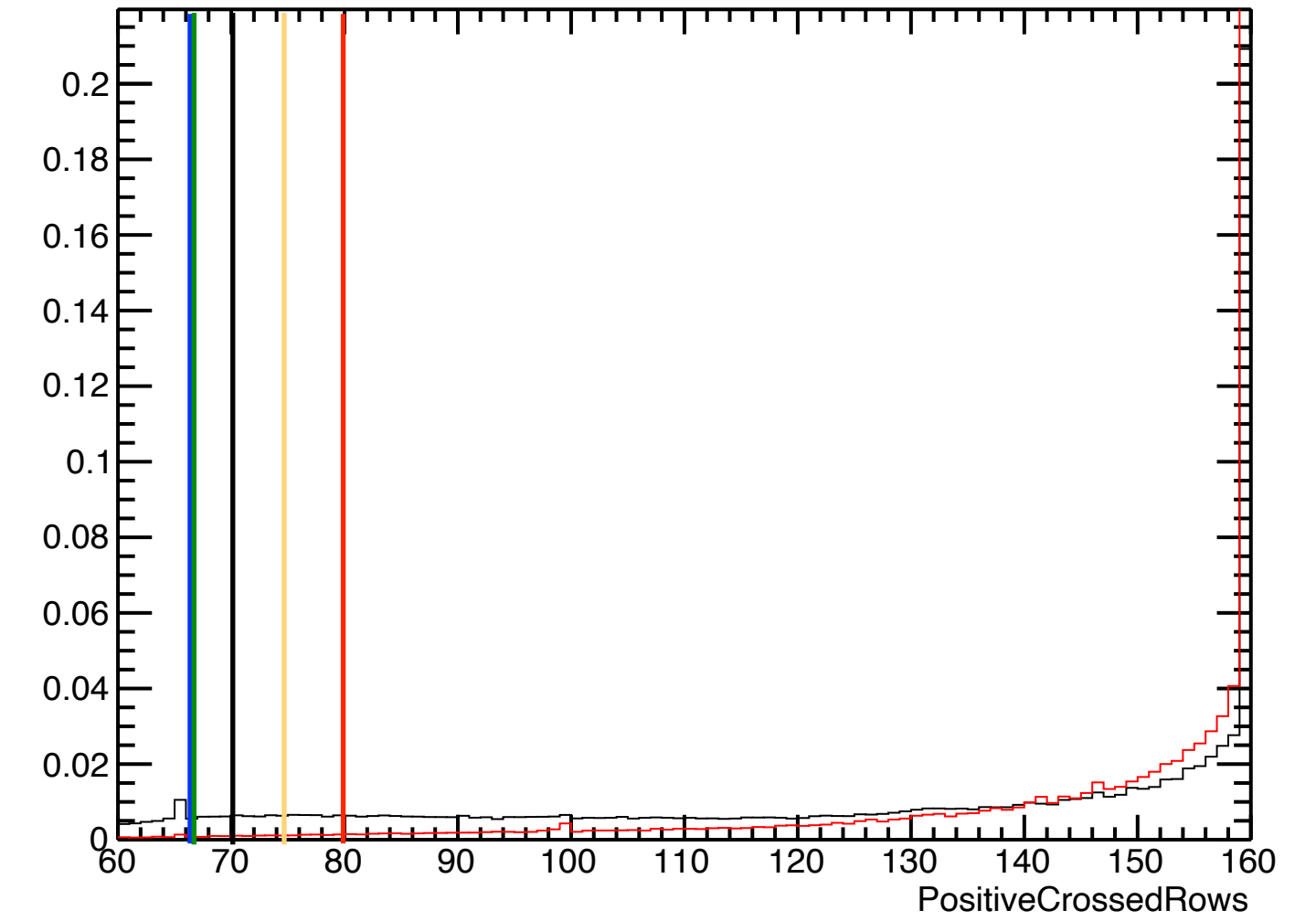
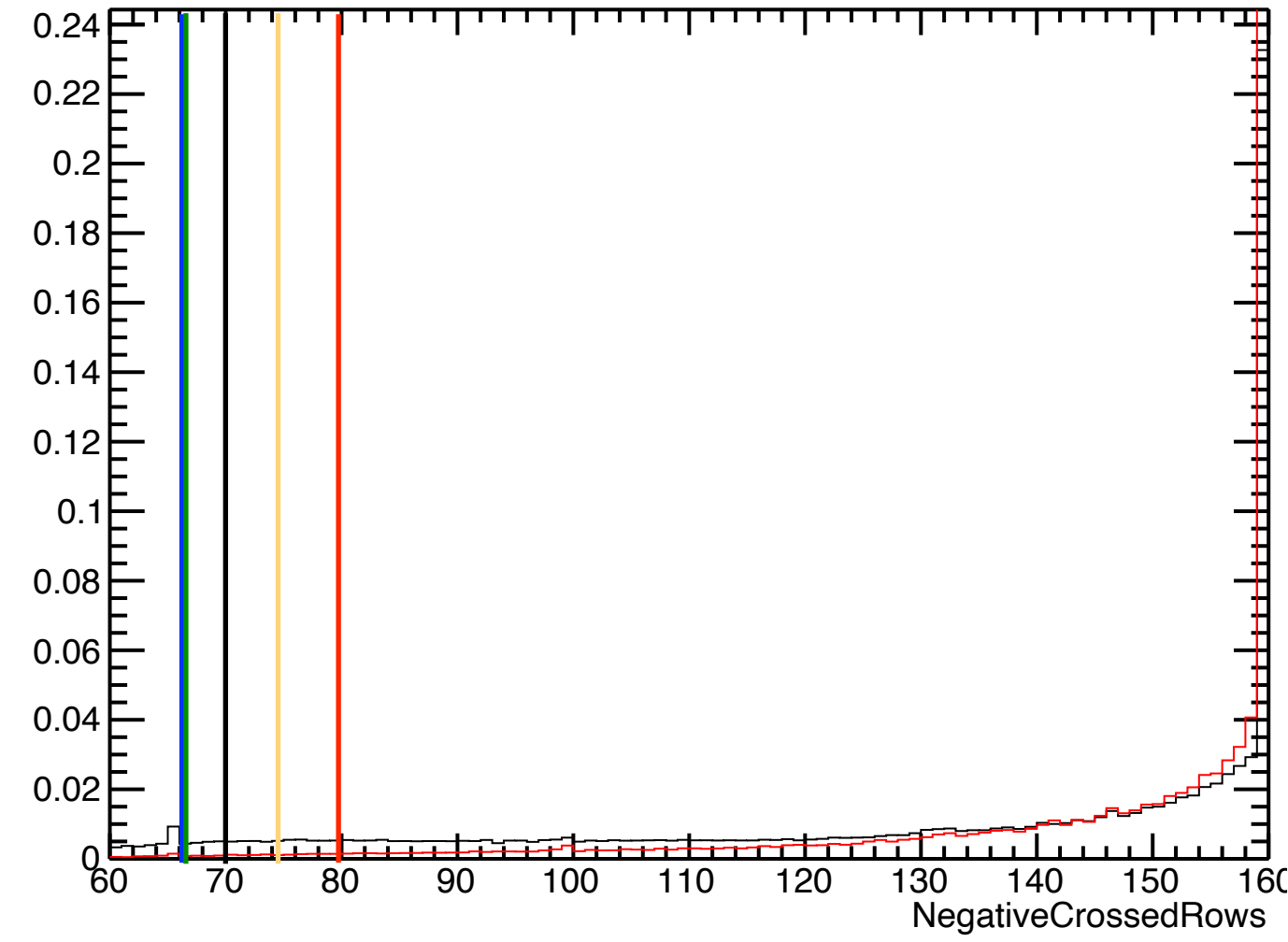
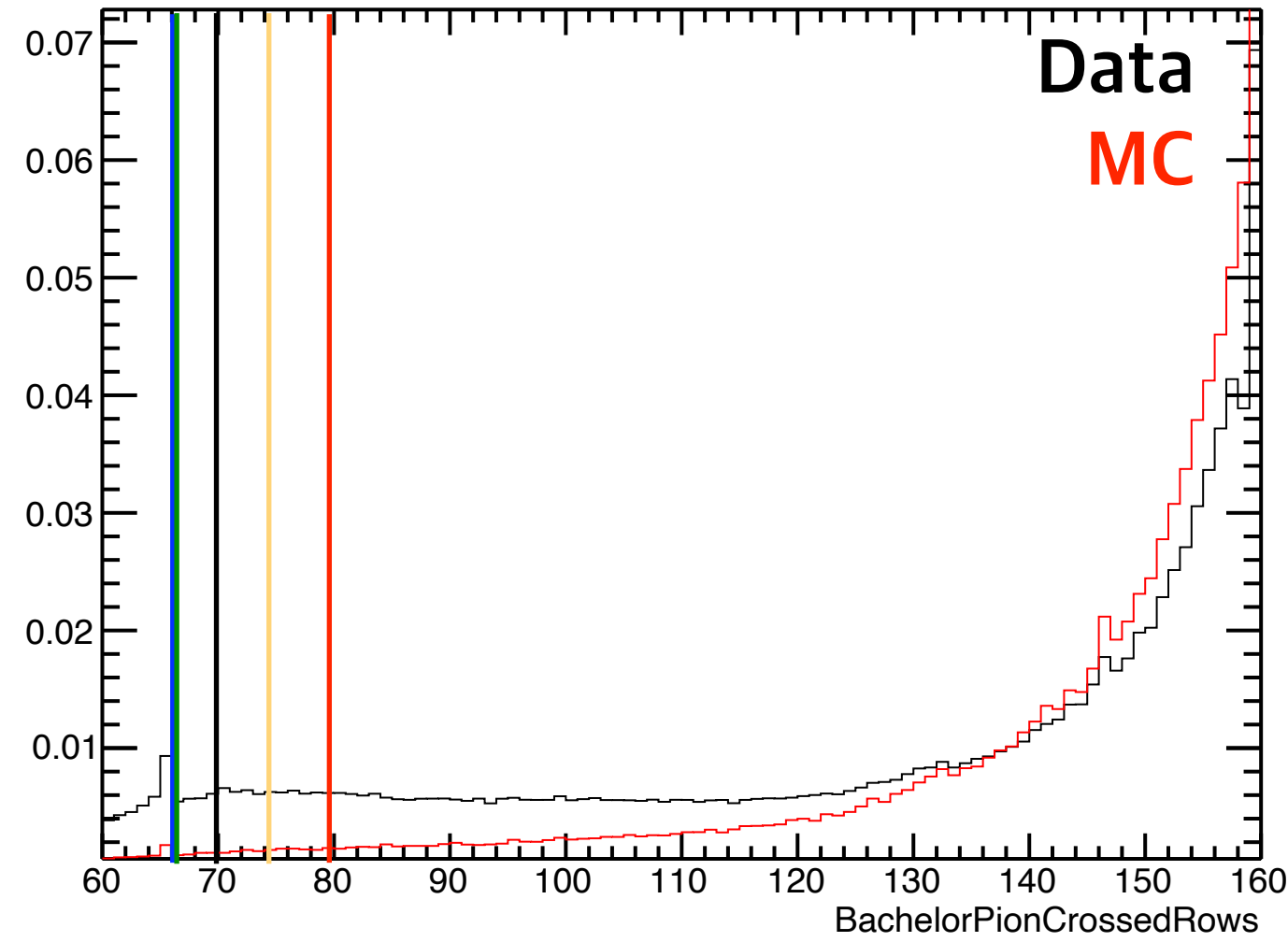
Jinjoo Seo\*  
Inha University\*

2021.01.28

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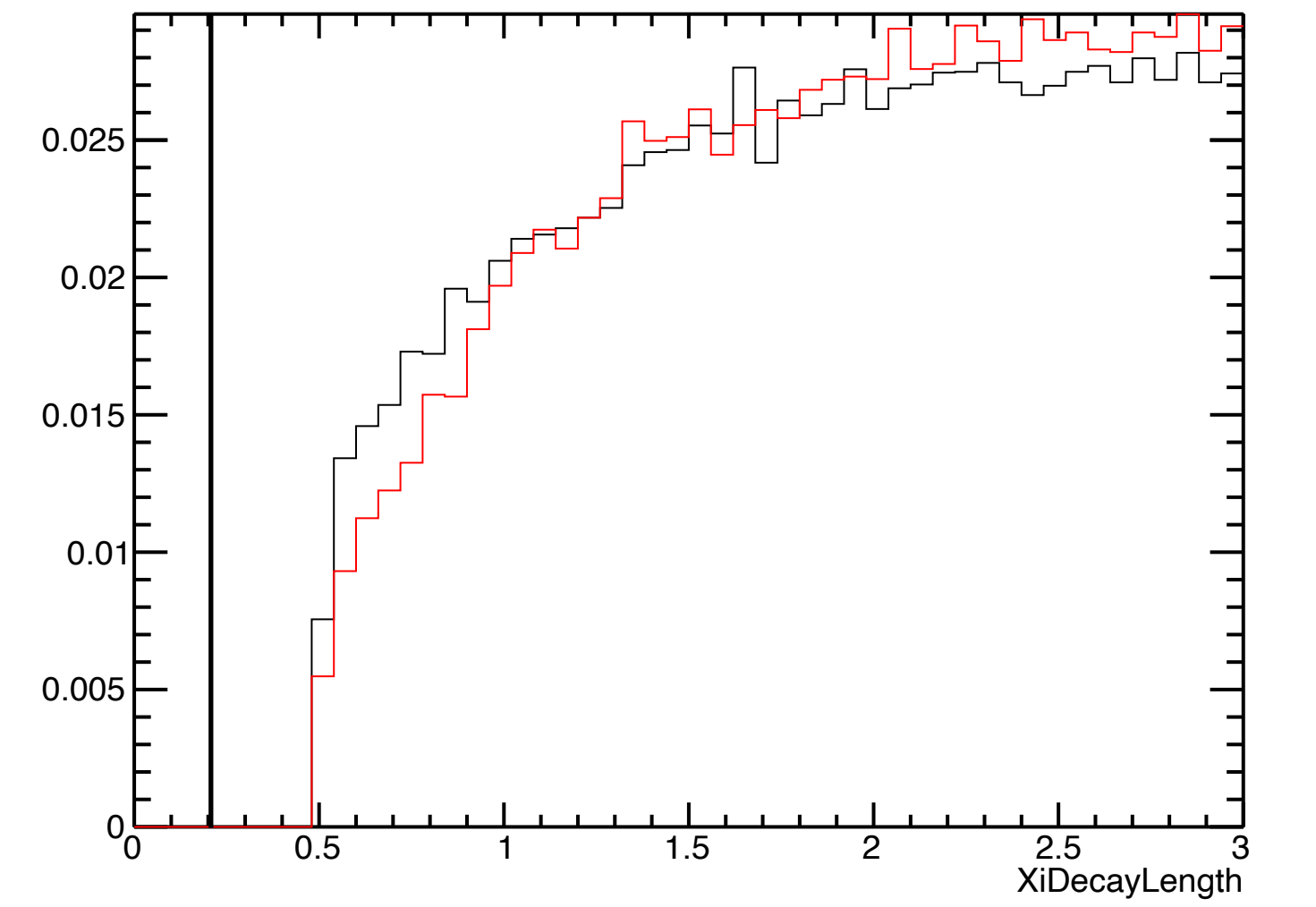
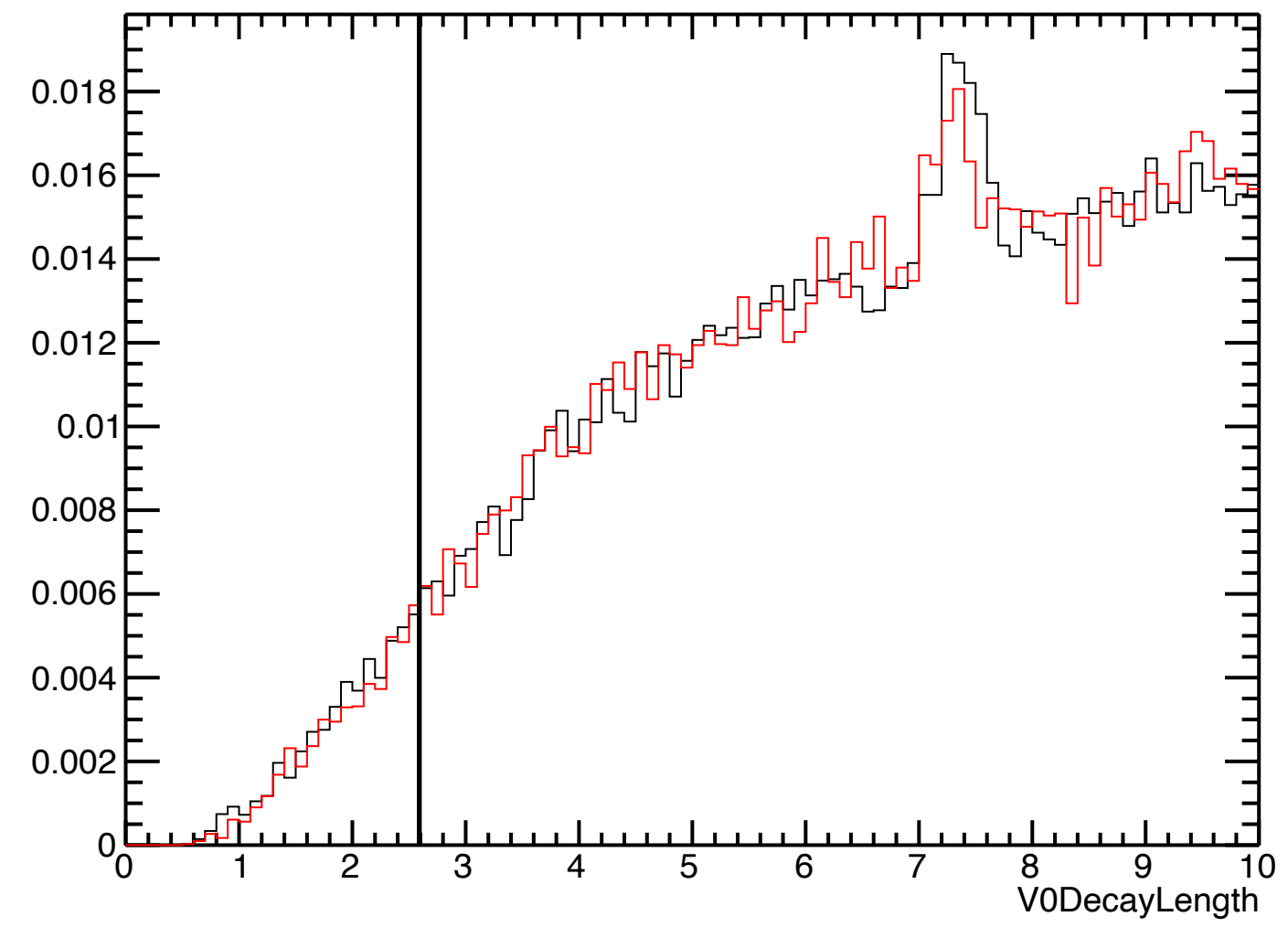
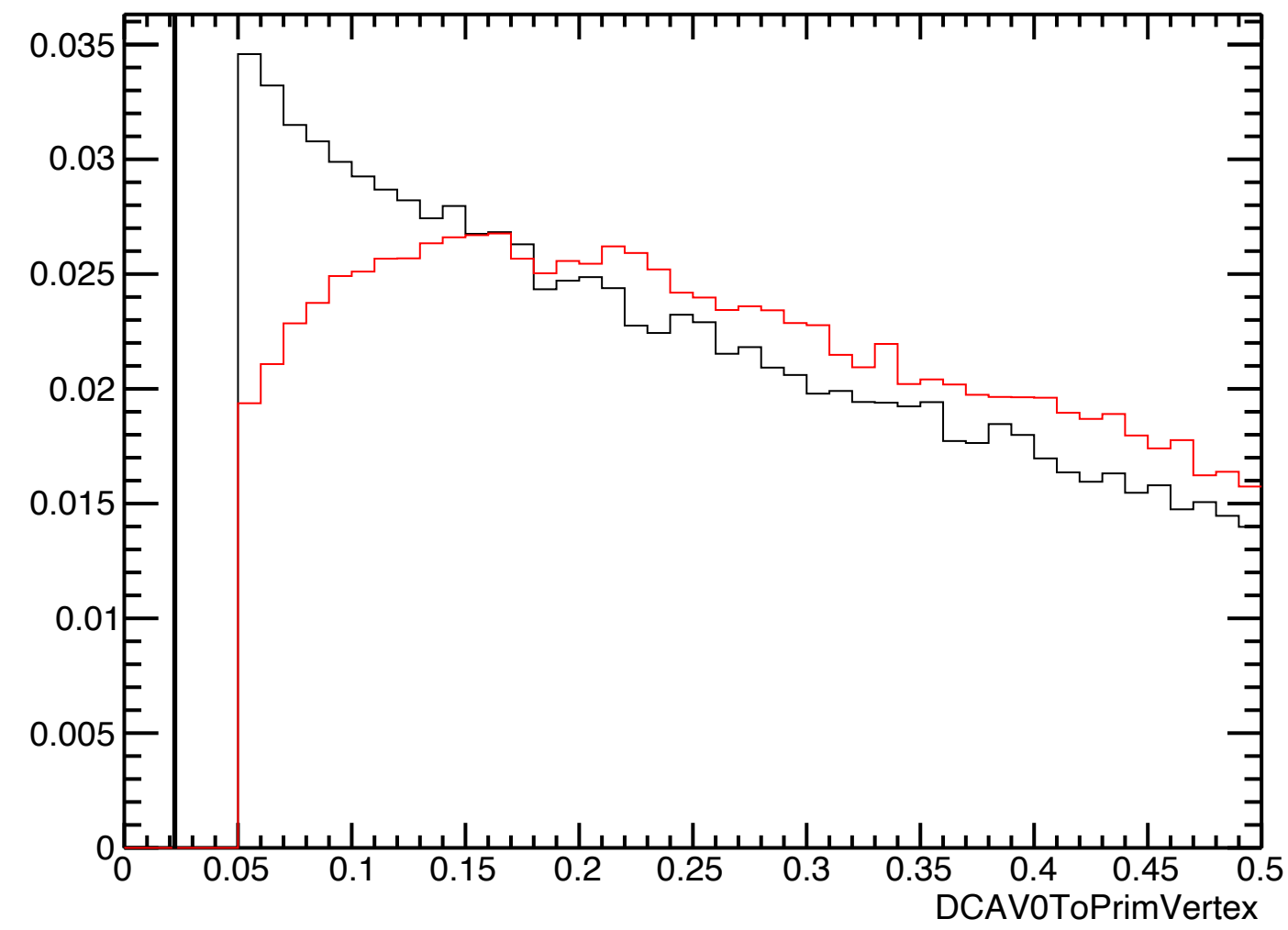
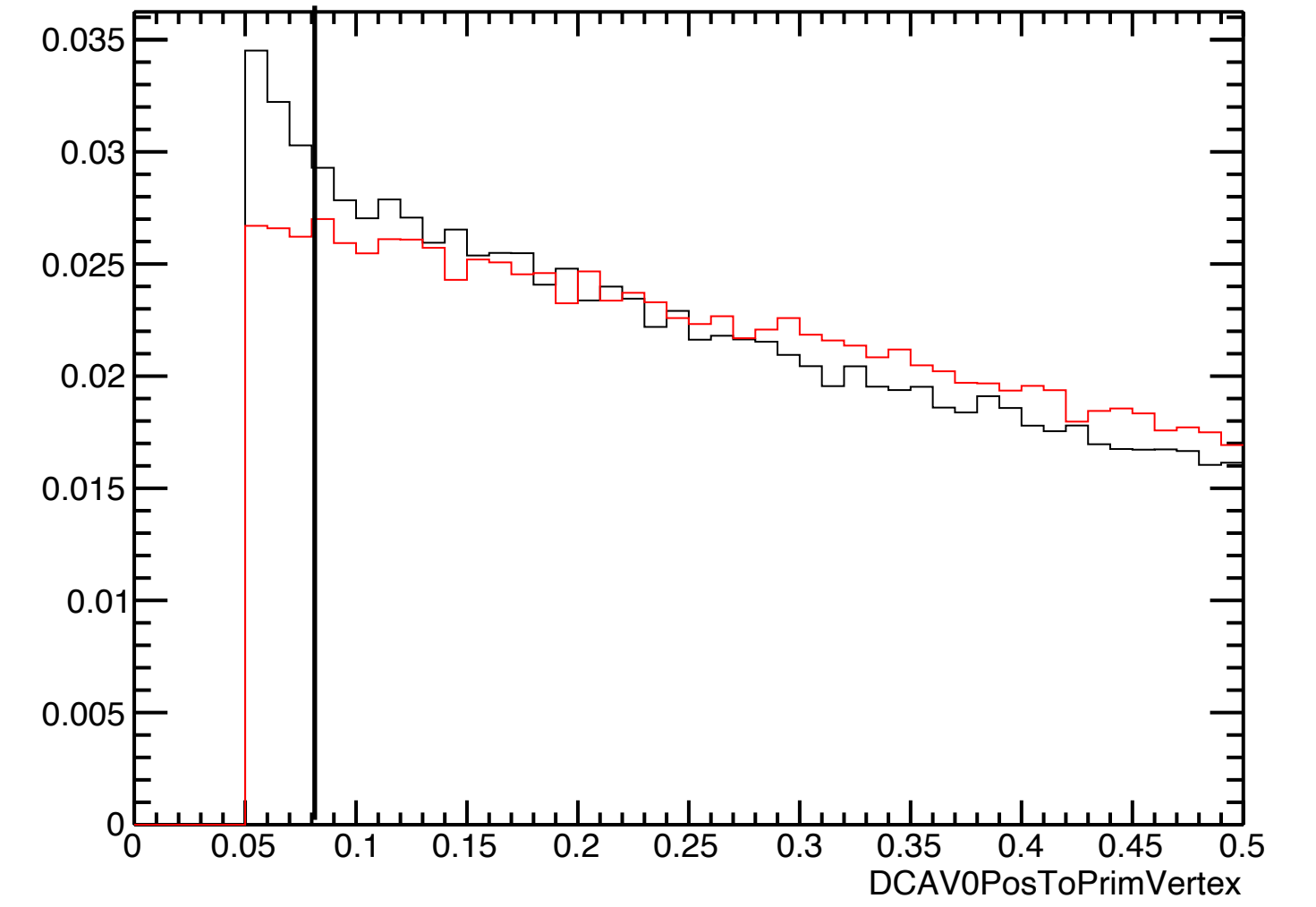
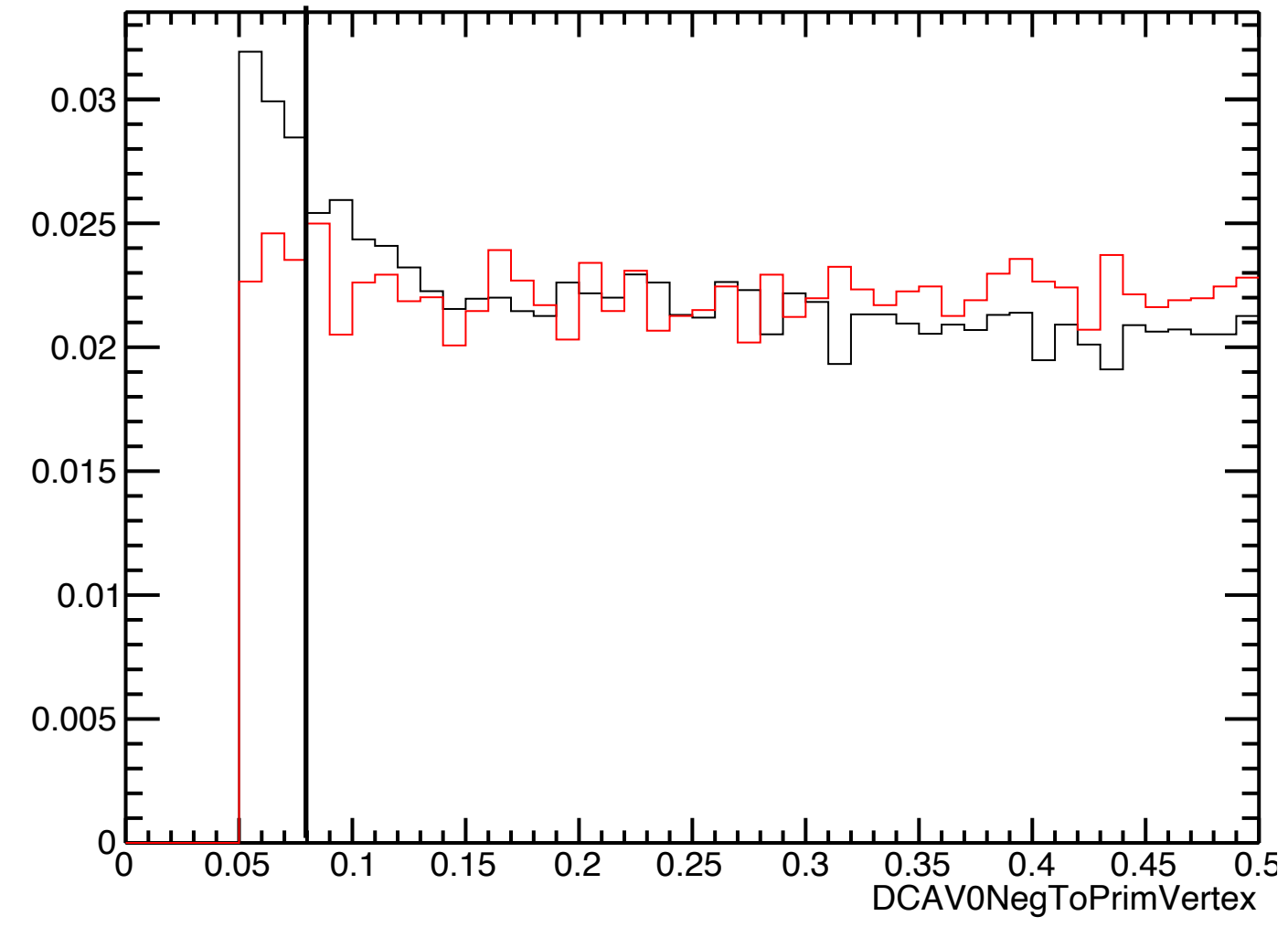
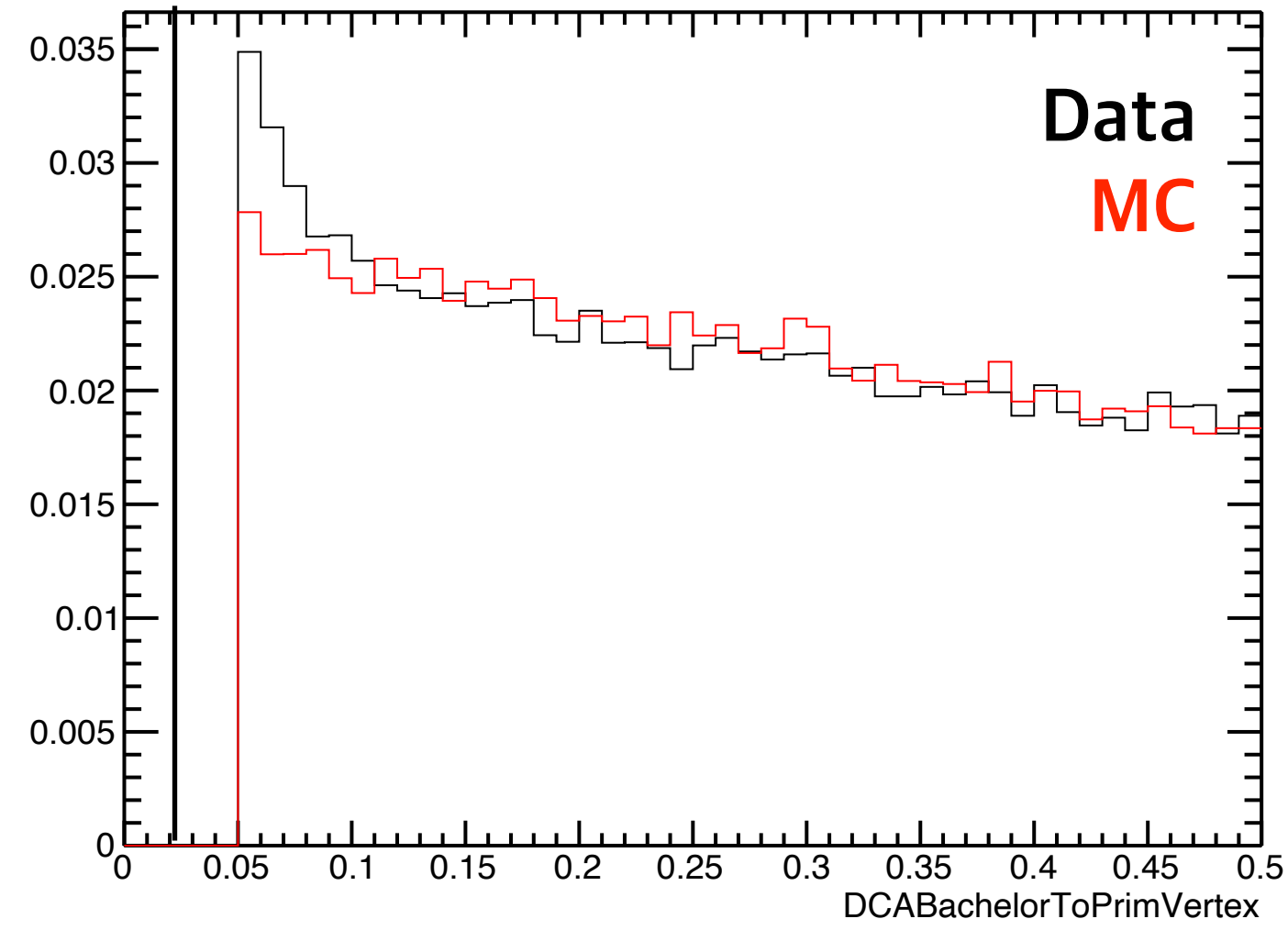
## Status

Cut variables	VeryLoose	Loose cut	Standard	Tight cut	VeryTight
# of CrossedRows	>65	>65	>70	>75	>80
CrossedRows/ Findable Cluster	>0.70	>0.75	>0.77	>0.79	>0.81

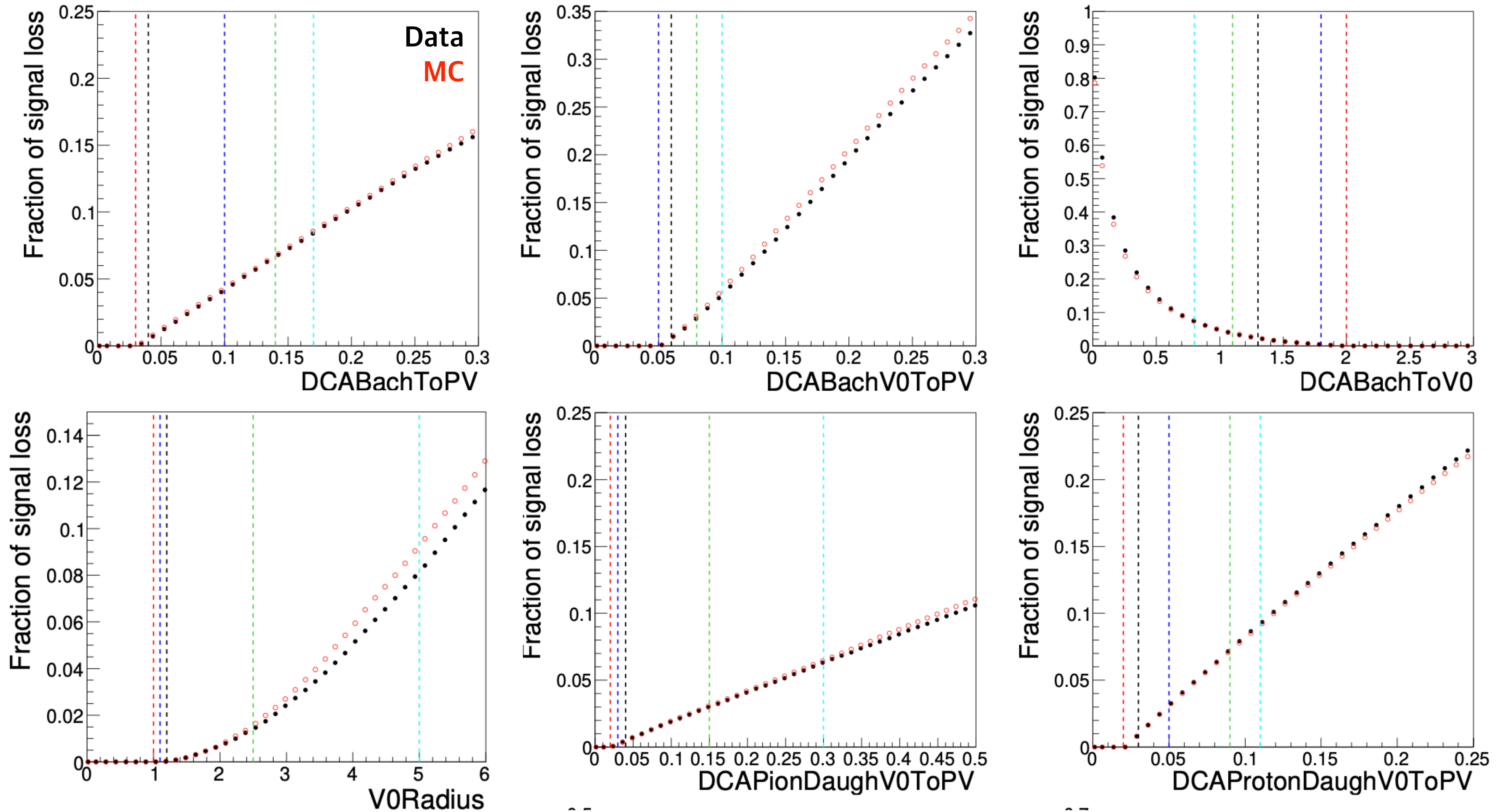


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### Default

Cut variables	VeryLoose	Loose	Standard	Tight	VertTight
$\Lambda$ Mass tolerance ( $MeV/c^2$ )	7.5	7.5	7.5	7.5	7.5
$\Xi$ Mass tolerance ( $MeV/c^2$ )	8	8	8	8	8
DCA of V0 to PV (cm)	>0.01	>0.02	>0.03	>0.04	>0.06
DCA of V0 daughters to PV (cm)	>0.05	>0.061	>0.073	>0.088	>0.102
V0 cosine of pointing angle to $\Xi$ vertex	>0.98	>0.981	>0.983	>0.9839	>0.985
DCA of bachelor track to PV (cm)	>0.01	>0.0146	>0.0204	>0.0275	>0.037
V0 decay length (cm)	>0.20	>1.55	>2.67	>3.6	>4.39
$\Xi$ decay length (cm)	>0.20	>0.29	>0.38	>0.53	>0.72

### New

Cut variables	VeryLoose	Loose	Standard	Tight	VertTight
$\Lambda$ Mass tolerance ( $MeV/c^2$ )	7.5	7.5	7.5	7.5	7.5
$\Xi$ Mass tolerance ( $MeV/c^2$ )	8	8	8	8	8
DCA of V0 to PV (cm)	>0.05	>0.05	>0.05	>0.1	>0.15
DCA of V0 daughters to PV (cm)	>0.05	>0.061	>0.073	>0.088	>0.102
V0 cosine of pointing angle to $\Xi$ vertex	>0.98	>0.981	>0.983	>0.9839	>0.985
DCA of bachelor track to PV (cm)	>0.05	>0.05	>0.05	>0.05	>0.1
V0 decay length (cm)	>1.1	>1.55	>2.67	>3.6	>4.39
$\Xi$ decay length (cm)	>0.5	>0.5	>0.5	>0.53	>0.72

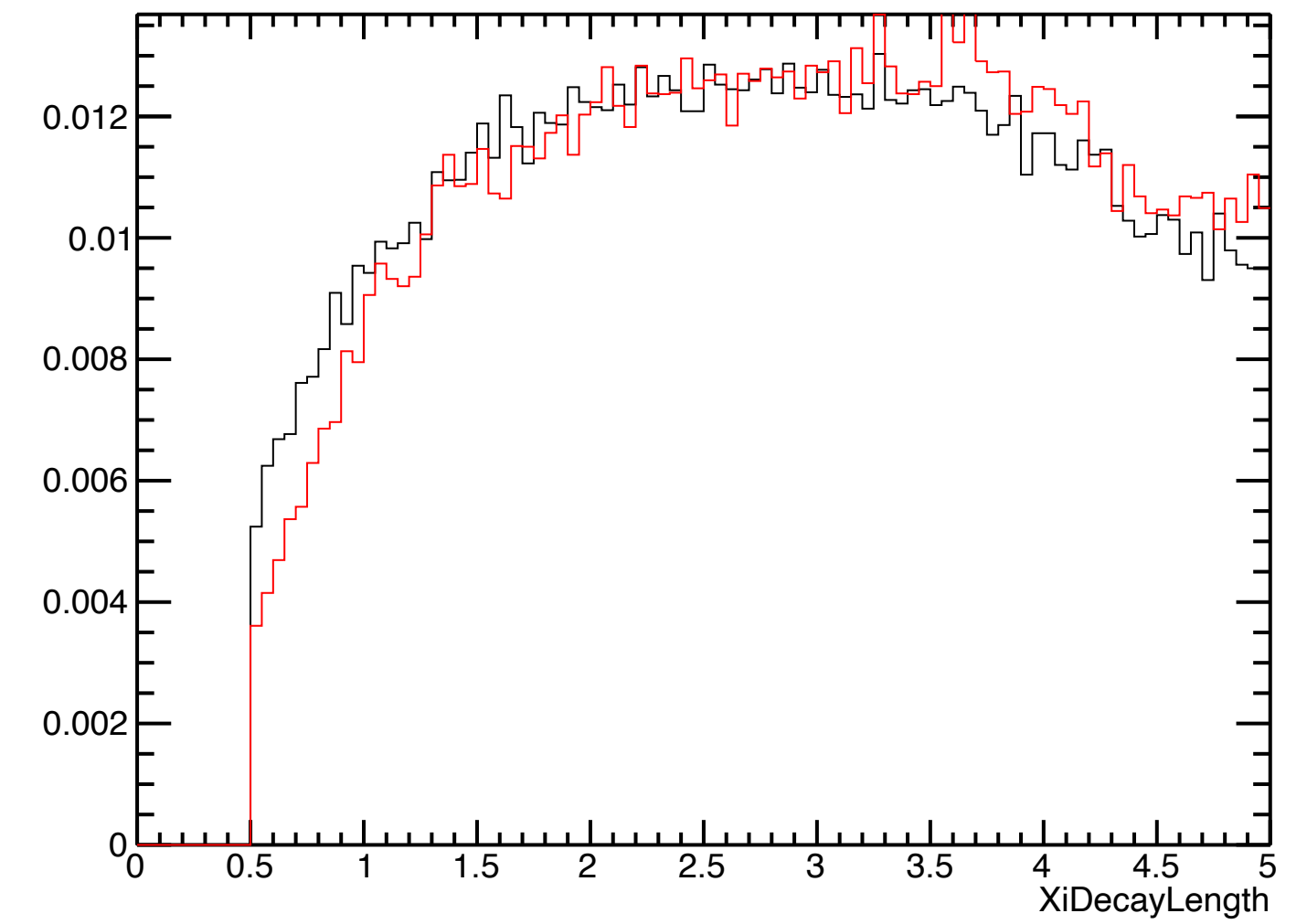
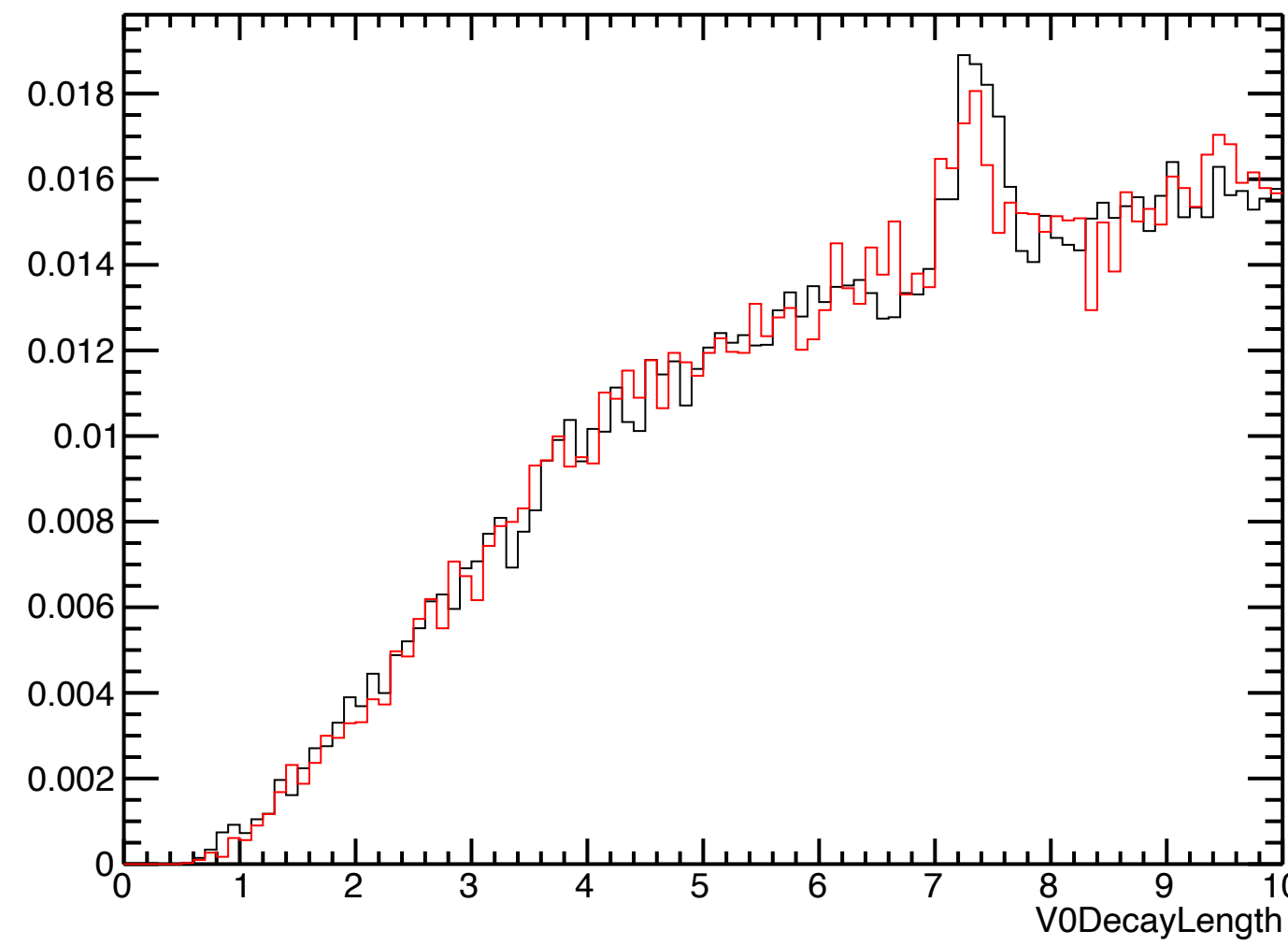
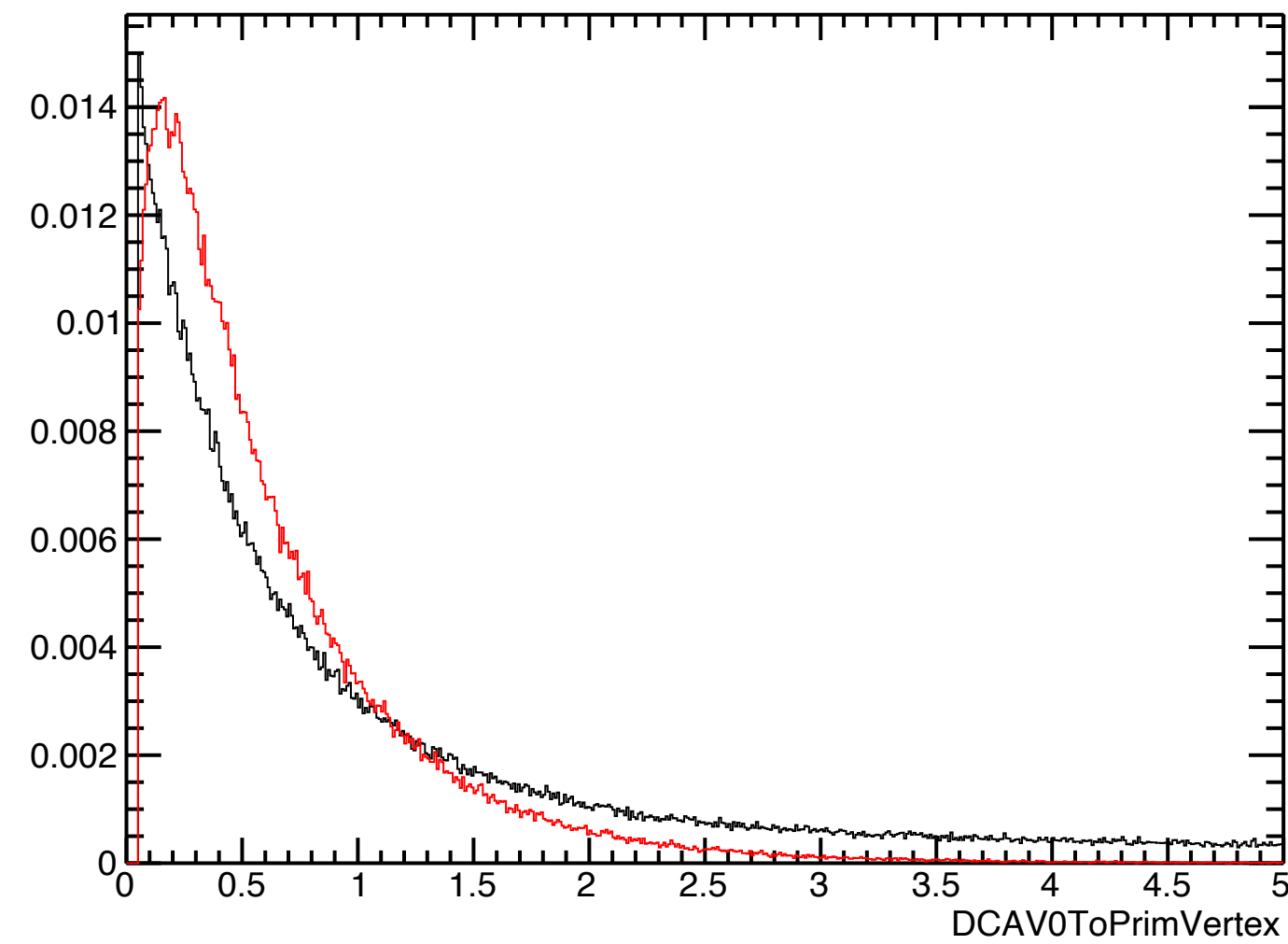
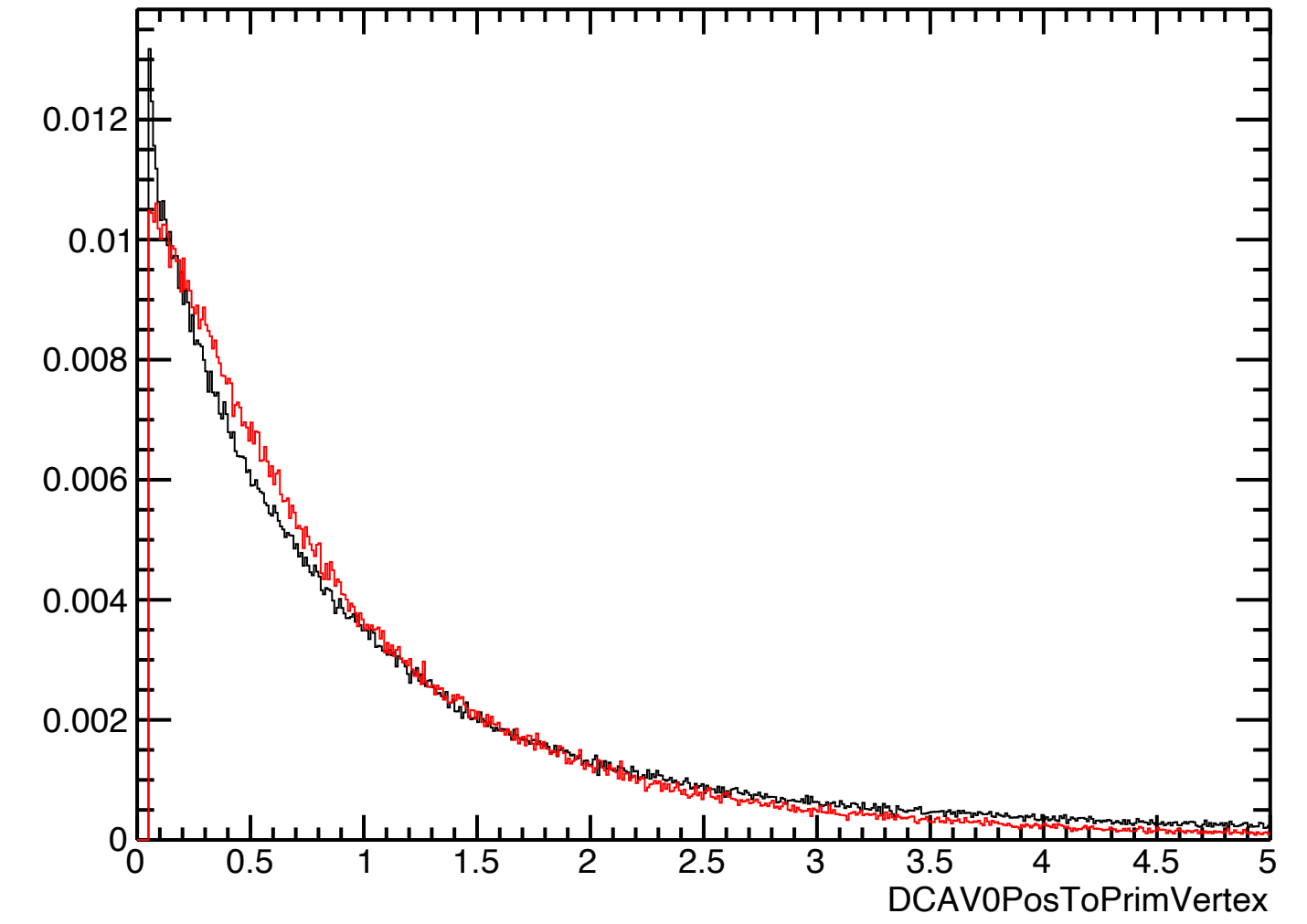
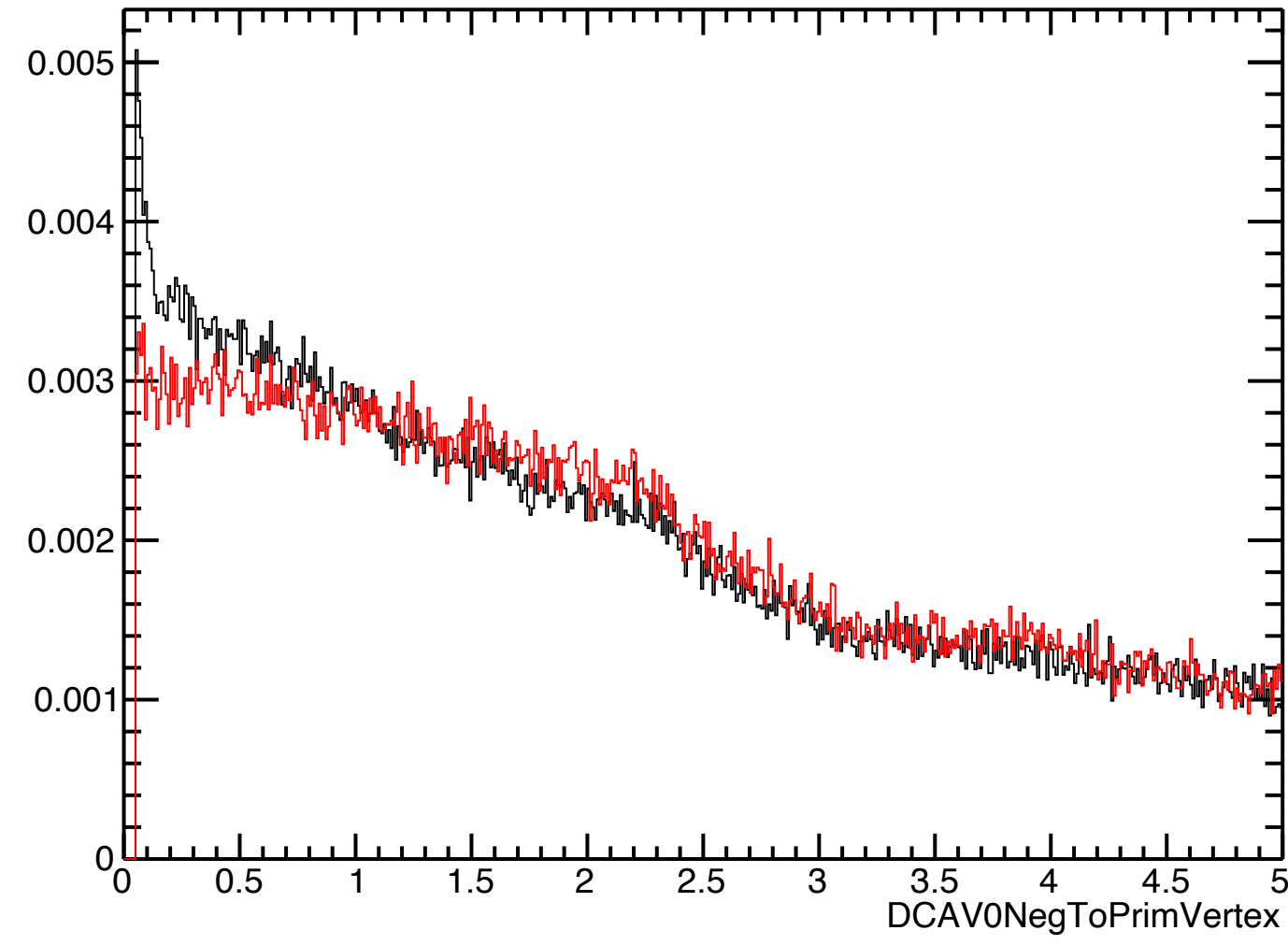
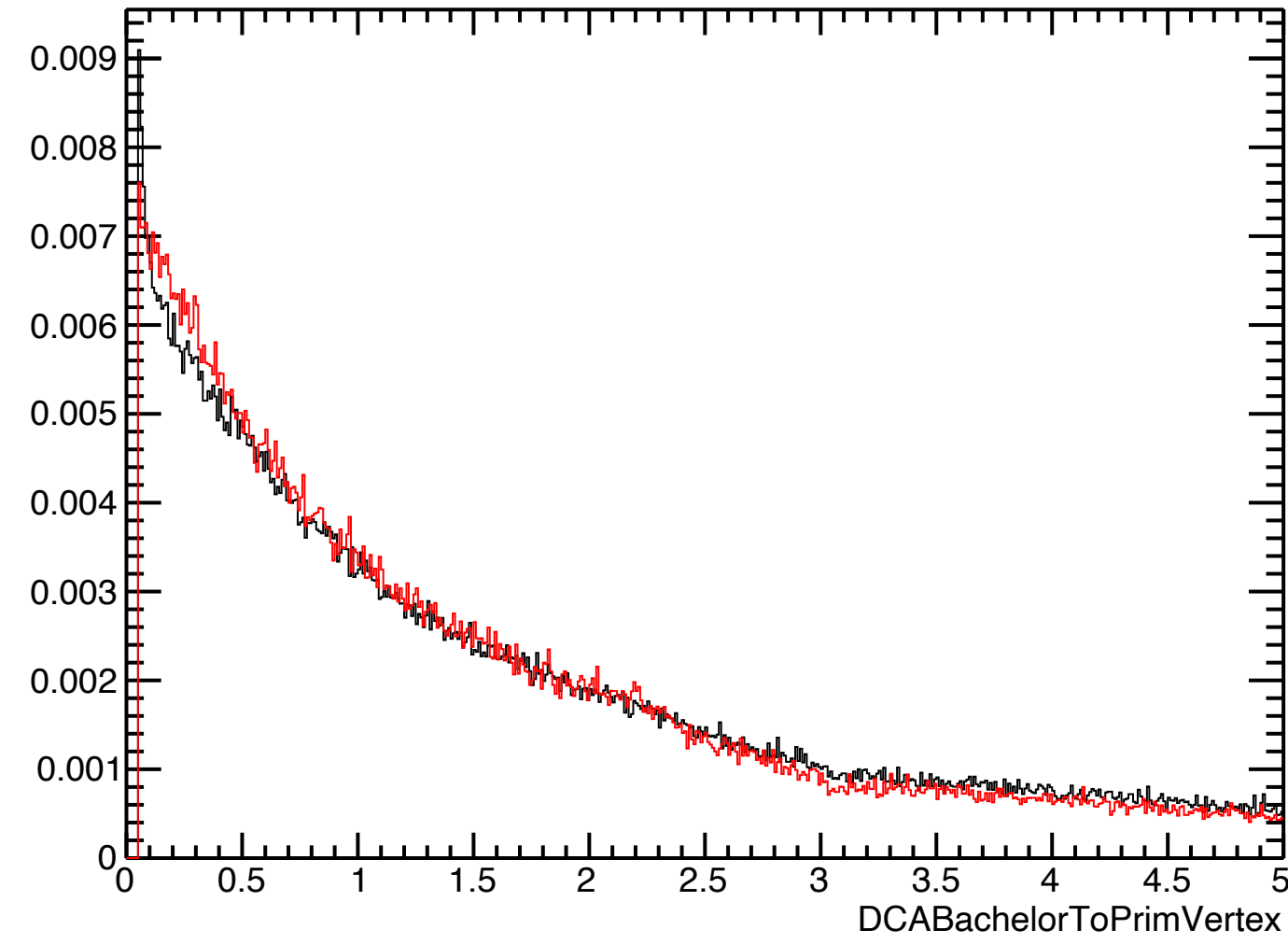
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**Table 3:** Selections applied to charged  $\Xi$  and  $\Omega$  candidates.

Topological Variable	$\Xi$ ( $\Omega$ ) Cut
Cascade transv. decay radius $R_{2D}$	$> 0.6$ (0.5) cm
V0 transv. decay radius	$> 1.2$ (1.1) cm
DCA (bach - PV)	$> 0.04$ cm
DCA (V0 - PV)	$> 0.06$ cm
DCA (meson V0 track - PV)	$> 0.04$ cm
DCA (baryon V0 track - PV)	$> 0.03$ cm
DCA (V0 tracks)	$< 1.5 \sigma$
DCA (bach - V0)	$< 1.3$ cm
cascade cos(PA)	$> 0.97$
V0 cos(PA)	$> 0.97$
V0 invariant mass window	$\pm 0.008 \text{ GeV}/c^2$

Xi cut variables	Cuts
Number of CrossedRows	$>70$
CrossedRows over findable	$>0.77$
$\Lambda$ Mass tolerance (MeV/c <sup>2</sup> )	7.5
$\Xi$ Mass tolerance (MeV/c <sup>2</sup> )	8
DCAof V0 to PV(cm)	$>0.03 \rightarrow >0.05$
DCA of V0 daughters PV (cm)	$>0.073$
V0 cosine pointing angle to $\Xi$	$>0.983$
DCA of bachelor track to PV	$>0.0204 \rightarrow >0.05$
V0 decay length (cm)	$>2.67$
$\Xi$ decay length (cm)	$>0.38 \rightarrow >0.5$
TPC $n\sigma$ (proton)	$<4$
TPC $n\sigma$ (pion)	$<4$

Cut variables	VeryLoose	Loose	Standard	Tight	VertTight
$\Lambda$ Mass tolerance (MeV/c <sup>2</sup> )	7.5	7.5	7.5	7.5	7.5
$\Xi$ Mass tolerance (MeV/c <sup>2</sup> )	8	8	8	8	8
DCA of V0 to PV (cm)	$>0.05$	$>0.02$	$>0.03$	$>0.04$	$>0.06$
DCA of V0 daughters to PV (cm)	$>0.05$	$>0.061$	$>0.073$	$>0.088$	$>0.102$
V0 cosine of pointing angle to $\Xi$ vertex	$>0.98$	$>0.981$	$>0.983$	$>0.9839$	$>0.985$
DCA of bachelor track to PV (cm)	$>0.01$	$>0.0146$	$>0.0204$	$>0.0275$	$>0.037$
V0 decay length (cm)	$>0.20$	$>1.55$	$>2.67$	$>3.6$	$>4.39$
$\Xi$ decay length (cm)	$>0.20$	$>0.29$	$>0.38$	$>0.53$	$>0.72$



# Strategy of extrapolation

- (1) Scale PYTHIA8 with factor (measured  $\Xi_c^0$  in  $2 < p_T < 8$ ) / (PYTHIA8  $\Xi_c^0$  in  $2 < p_T < 8$ )
- (2) Central value: Integral PYTHIA8 **mode2**  $p_T > 0$  to obtain the number of  $\Xi_c^0$  cross section in  $p_T > 0$
- (3) Stat.: the measured stat. uncertainty in  $2 < p_T < 8$
- (4) Syst.: Sum in quadrature (measured syst. uncertainty in  $2 < p_T < 8$ ) and (syst. uncertainty in  $0 < p_T < 2$  &  $p_T > 8$  with PYTHIA8 **mode0** & **mode3**)
  - ⊙ Syst. of PYTHIA8:  $0 < p_T < 2$  and  $p_T > 8$  are calculated separately and are considered as fully correlated
    - $0 < p_T < 2$ : (**mode0**<**mode2**) & (**mode3**<**mode2**) & (**mode3**<**mode0**), only **mode3** assigned as syst. in lower limit
    - $p_T > 8$ : (**mode3**>**mode2**) & (**mode0**<**mode2**), **mode3** assigned as upper and **mode0** as lower limit

