Cross Section He4(e,e'p_backward)X

6-fold: (d\Omega_e) * (d\E'_e) (d\Omega_p)*(d\p_p)

1. Theta and phi cut for electron
2. dE for electron
3. Theta and phi cut for proton
4. dp for proton

N_A = 6.02e23 atom/mol, A_z = 4 g/mol, 1 barn = 1e24 cm^2
electron charge :1.6e-19 C/electron

	Parameter	Unit	Kin 12 value
1.	Target density d_loss at 4 uA = 1.2%	g/cm^3	33.834 * 10^-3
2.	Target Length	cm	15
3.	Total Charge	C	2.27381
4.	d_theta_electron	rad	2*0.040 =0.08
5.	d_phi_electron	rad	2*0.020 = 0.04
6.	sin(L_angle)		Sin(20.3) = 0.3469
7.	d_E'_electron	GeV	3.75-3.45 = 0.3
8.	d_theta_proton	rad	0.4-(-0.2) = 0.6
9.	d_phi_proton	rad	2*0.1 = 0.2
10.	sin(BB_angle)		Sin(97) = 0.9925
11.	d_momentum_proton	GeV/c	1.2- 0.2 = 1.0
12.	N_pass_cut	entries	(peak)-(bg) = 54371-33406 = 20965 entries

13	Target area number density= (Target density)*(target Length)*(N_A)/(A_z)	Atom/ cm^2 or atom/barn	7.638e22 atom/cm^2 7.638e-2 atom/barn
14	N_electron= (Total charge)/ (Electron charge)	electron	1.421e+19
15	N_electron_target_area_number_density	electron *atom/barn	1.085e+18

16	dOmega_electron =sin(L_angle)*d_theta *d_phi	srad	1.110e-03
17	dOmega_proton =sin(BB_angle)*d_theta*d_phi	srad	0.1191
18.	Raw cross section = N_pass_cut/ (dOmega_e*dE_e*dOmega_p*dmomentum_p) –---------- N_electron_Target_area_number_density		20965 (proton) –---------- (1.110e-03 srad)*(0.3 GeV)*(0.1191 srad)*(1 GeV/c) *(1.085e18 electron*atom/barn) =20965/4.3031e+13 = 4.872e-10 proton *barn –---------- srad^2* GeV^2/c*electron*atom
19	(dOmega_e*dE_e*dOmega_p) *N_electron_Target_area_number_density		4.3031e+13 srad^2*GeV*electron*atom/barn
20	Raw cross section = N/dp*[19] where dp is the width of the bin		Proton/[parameter] –---------- srad^2*GeV*electron*atom/barn

Raw cross section

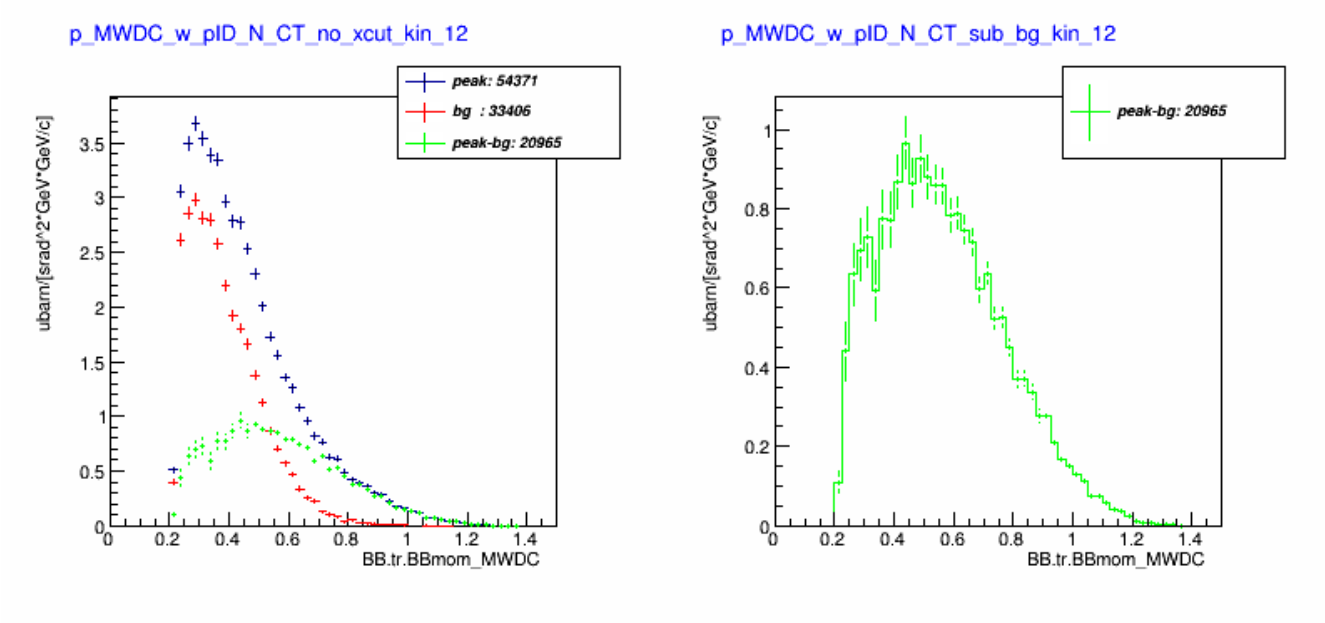
$$= \frac{N\_pass\_cut/(dOmega\_e*dE\_e*dOmega\_p*dmomentum\_p)}{N\_electron\_Target\_area\_number\_density}$$

where
Target_area_number_density = (Target density)*(target Length)*(N_A)/(A_z)
N_electron = (Total charge)/(Electron charge)

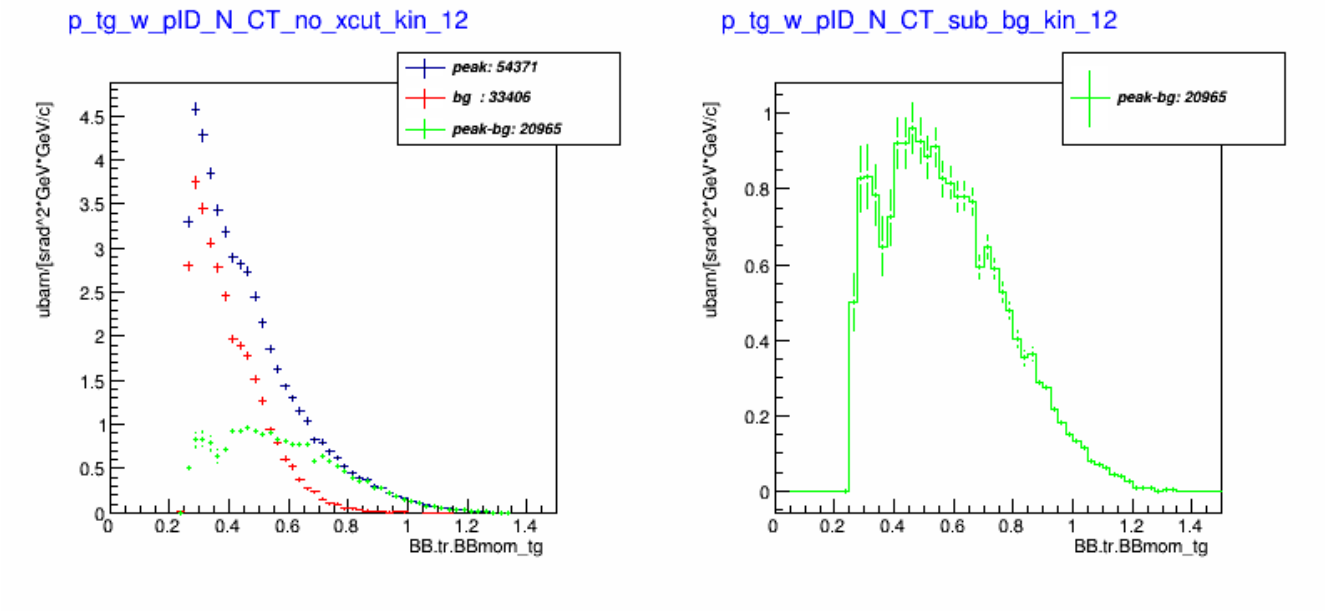
N_electron_Target_area_number_density = (Target density)*(target Length)*(N_A)/(A_z)*(Total charge)/(Electron charge)

$$Raw(Kin12) = \frac{[proton]/[(1.110e\text{-}03\ srad)*(0.3\ GeV)*(0.1191\ srad)*(d\_momentum)]}{[1.085e+18\ \ electron*atom/barn\ ]}$$

$$= \frac{[proton]}{[d\_momentum]*[4.3031e13\ srad^2*GeV/barn]}$$

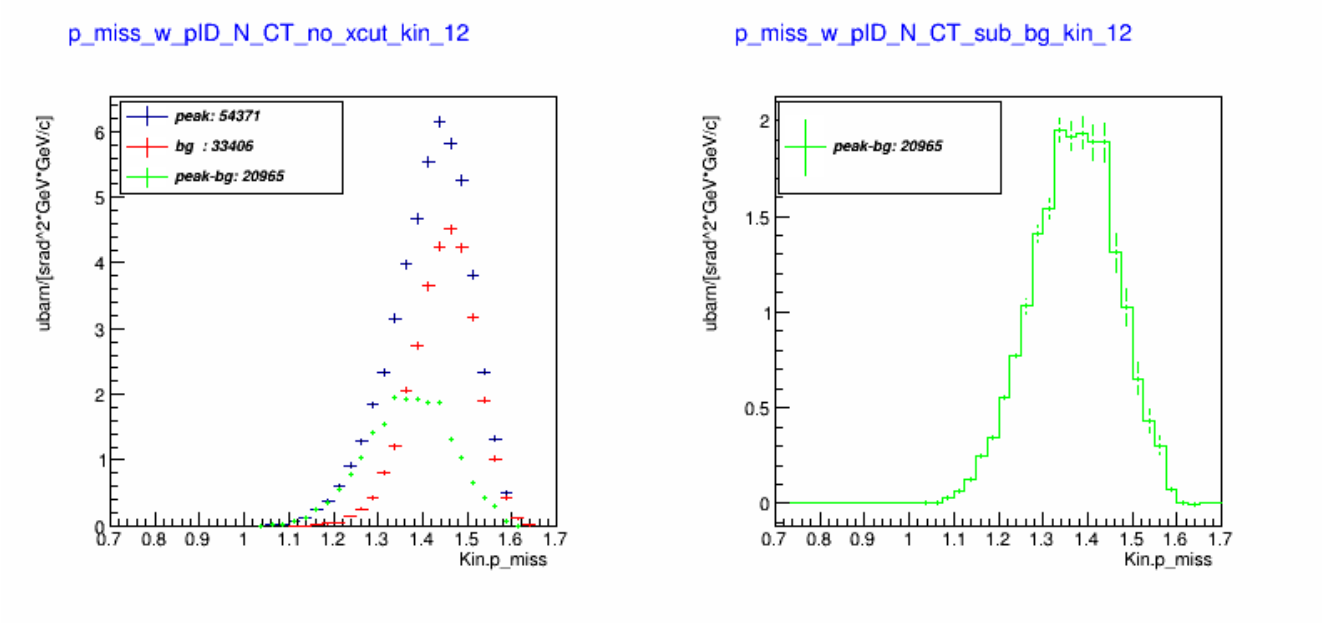


Kin12: p_MWDC cross section

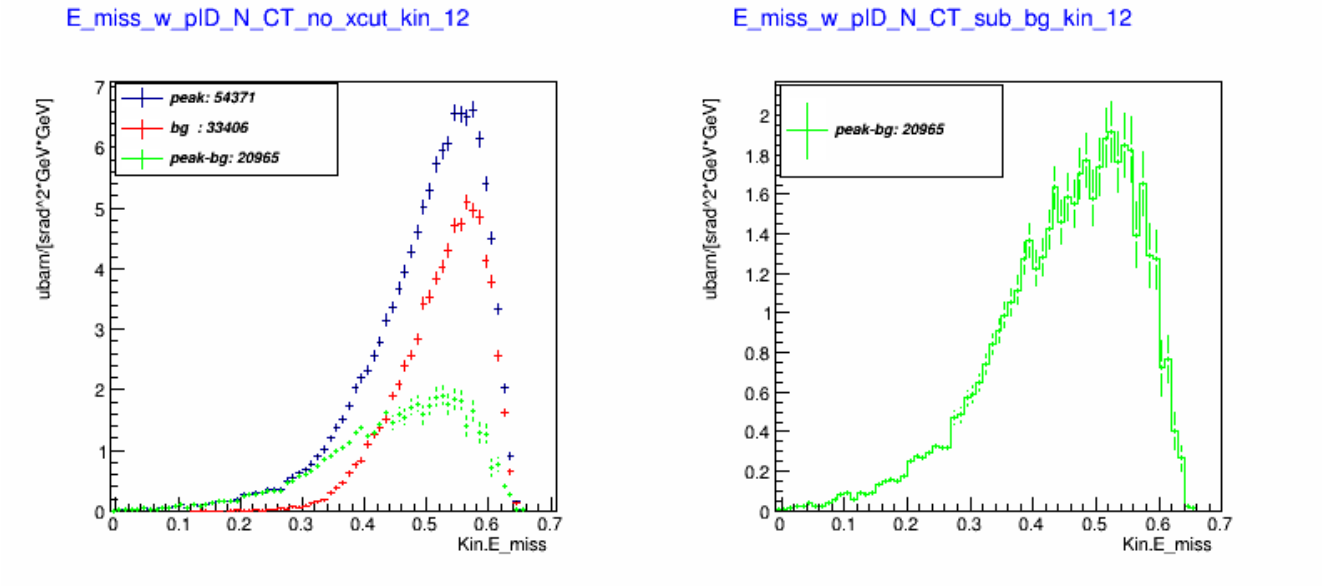


Kin12: p_target cross section

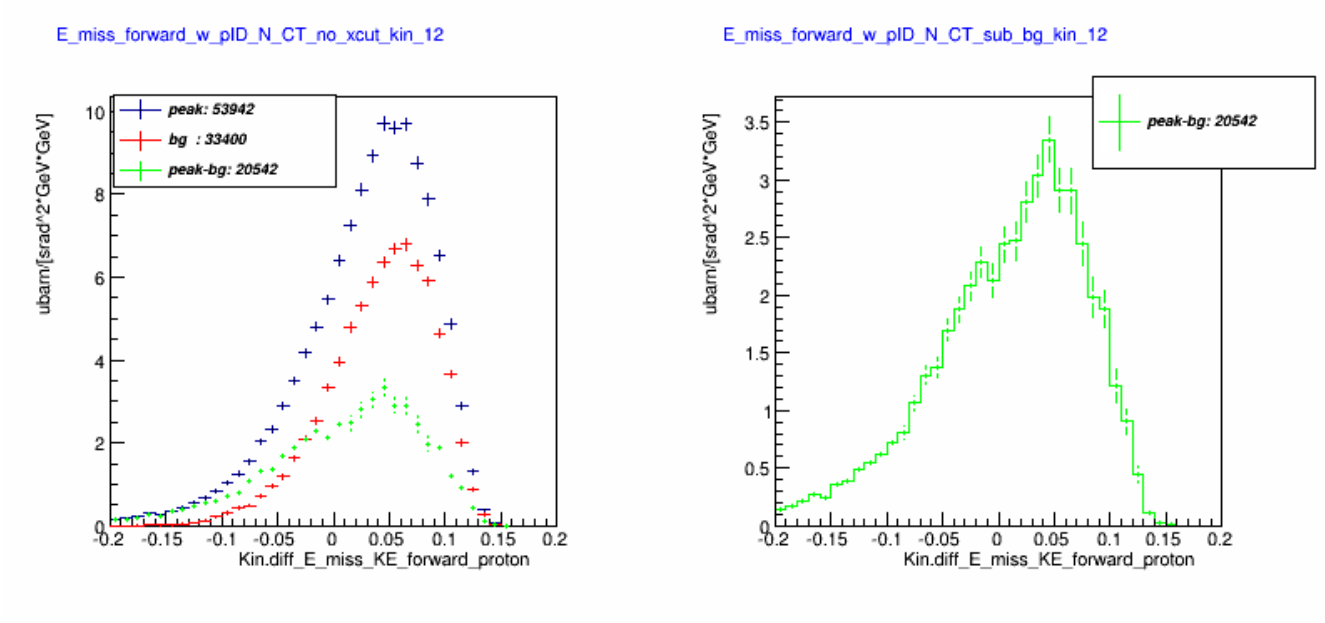
** what is the dip at 0.4 ? whether it is the deep due to the inefficiency?



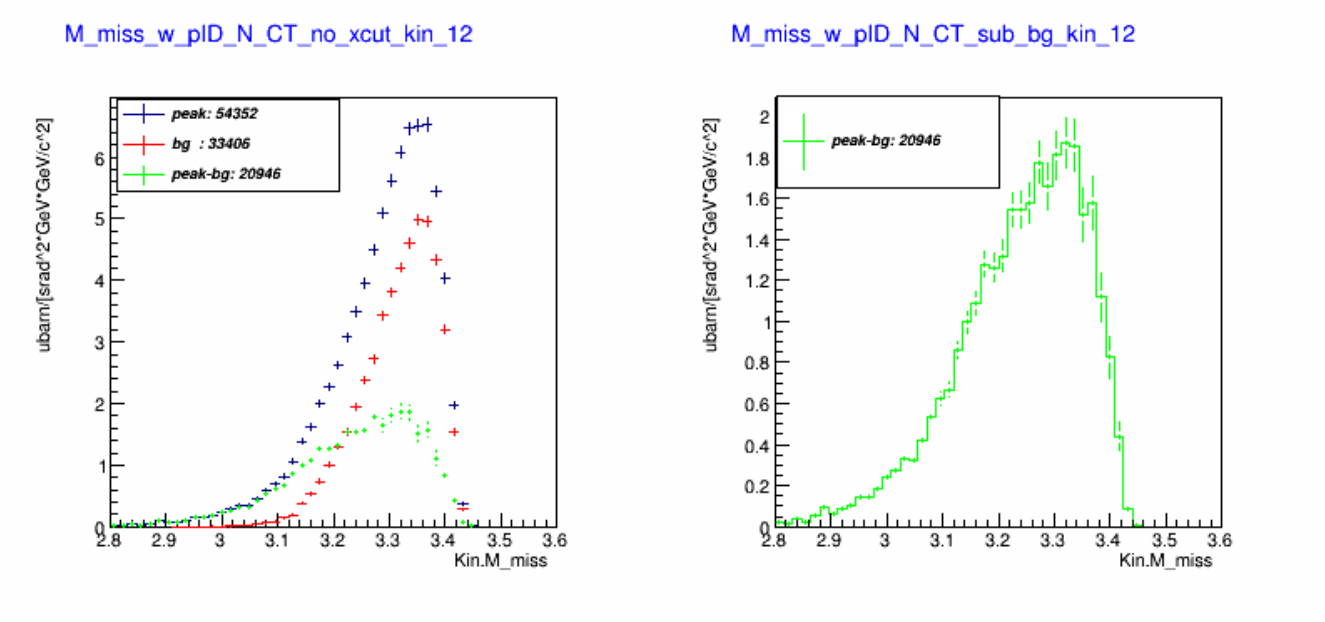
Kin12: P_miss cross section



Kin12: E_miss cross section
E_miss = w-(T_recoil)-(T_proton)



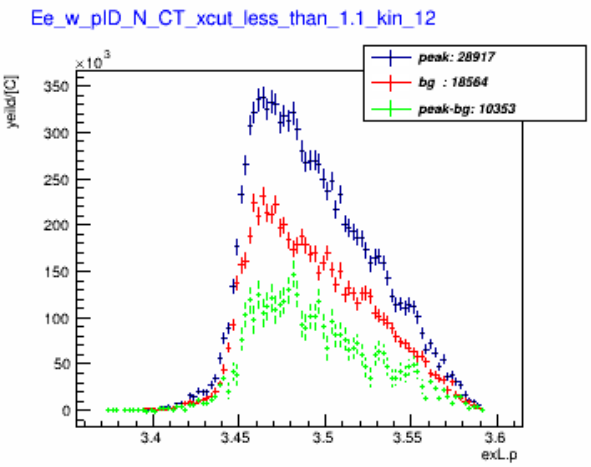
Kin12: E_miss_forward cross section
E_miss_forward = w-(T_forward_proton_assuming_all_p_miss)-(T_proton)

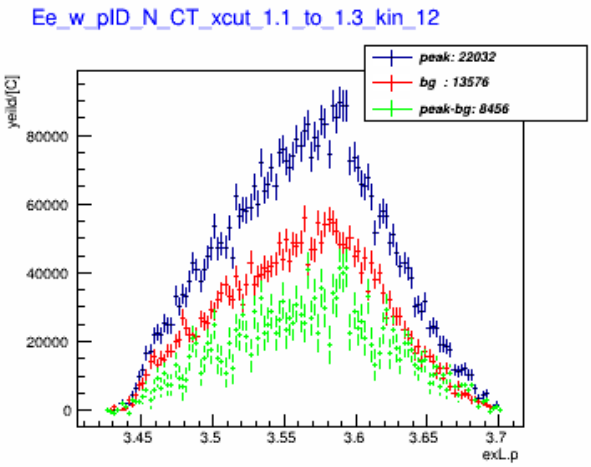


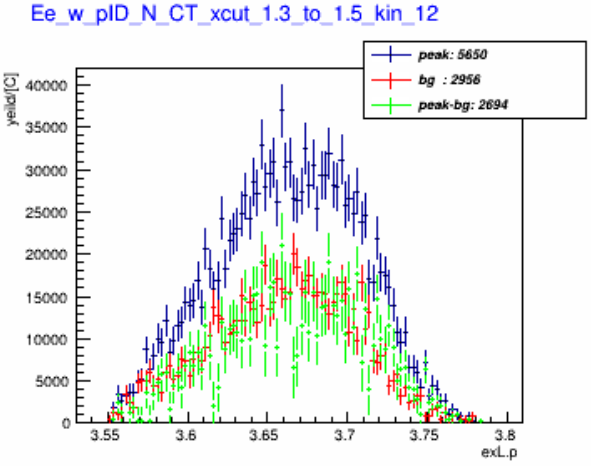
Kin12: M_miss cross section

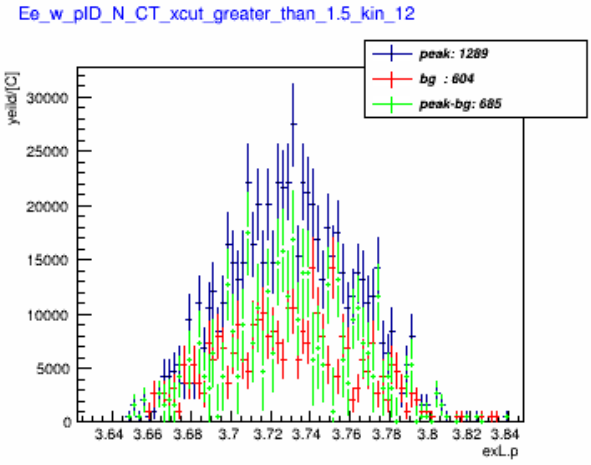
The Effect of Xcut on the Energy range in electron

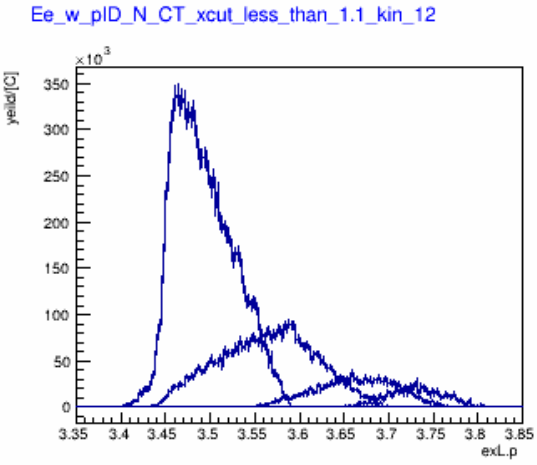
	X_range	E_electron [GeV]	DeltaE [GeV]
Previous cut	~0.8-1.8	Cut: 3.45-3.75	0.3
1.	Cut :<=1.1	3.40-3.59	0.19
2.	Cut:1.1-1.3	3.43-3.70	0.27
3.	Cut:1.3-1.5	3.55-3.78	0.23
4.	Cut:>=1.5	3.65-3.84	0.21

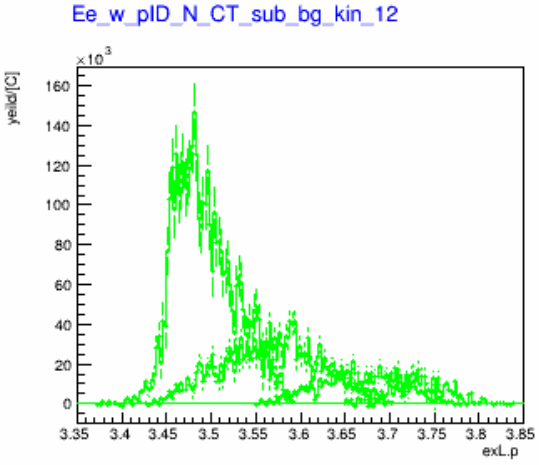






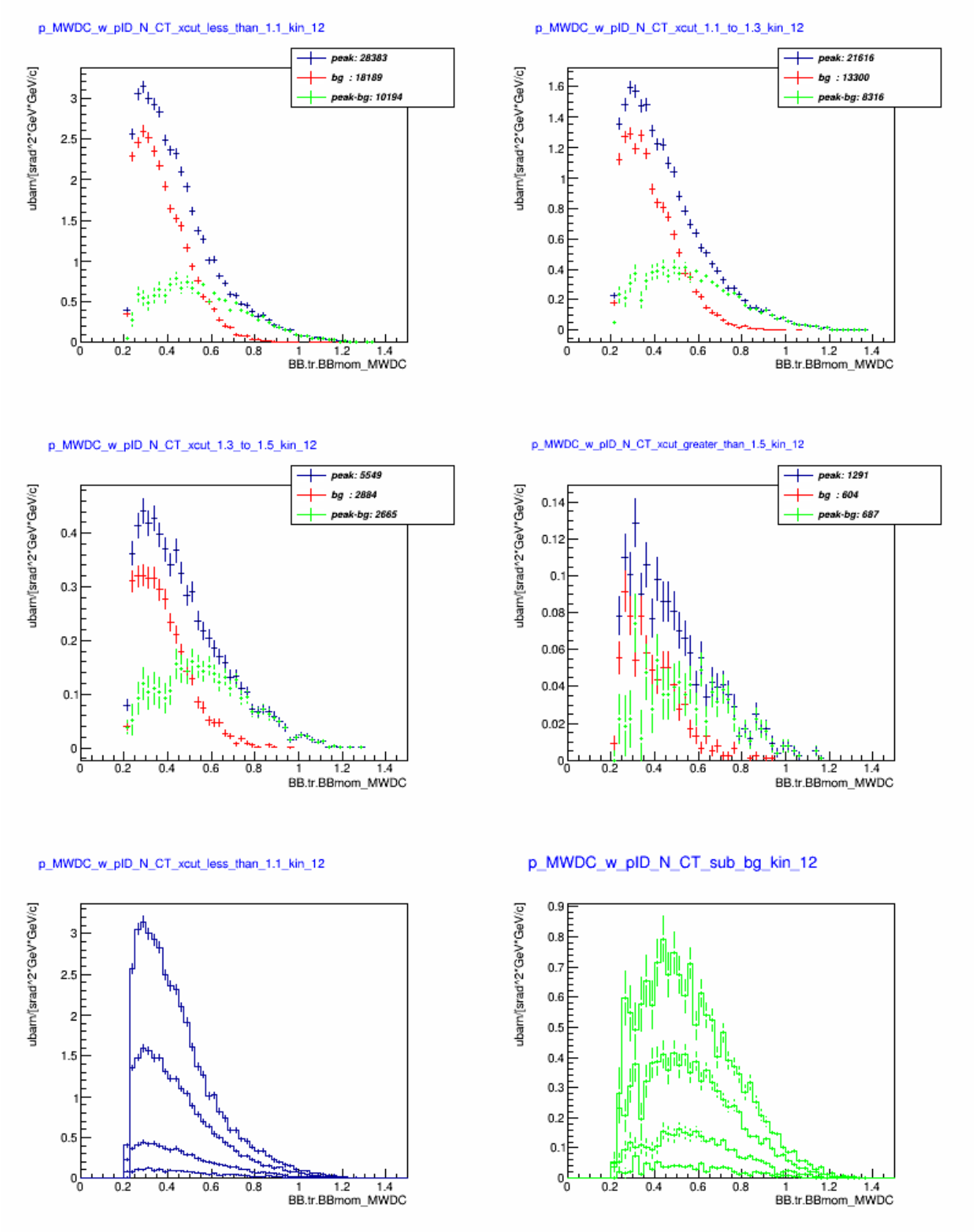




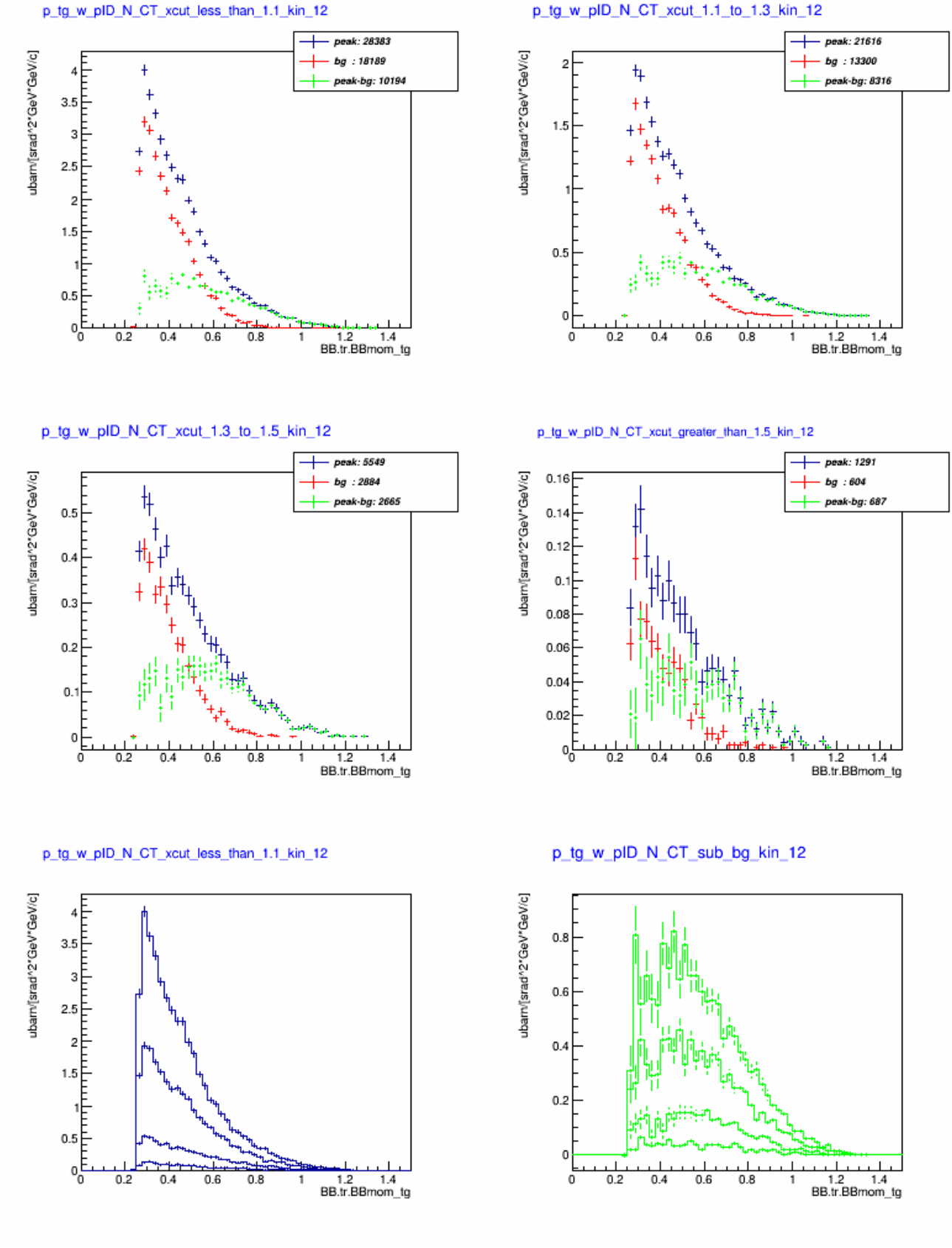


Kin12:Energy electron with varius Xcut

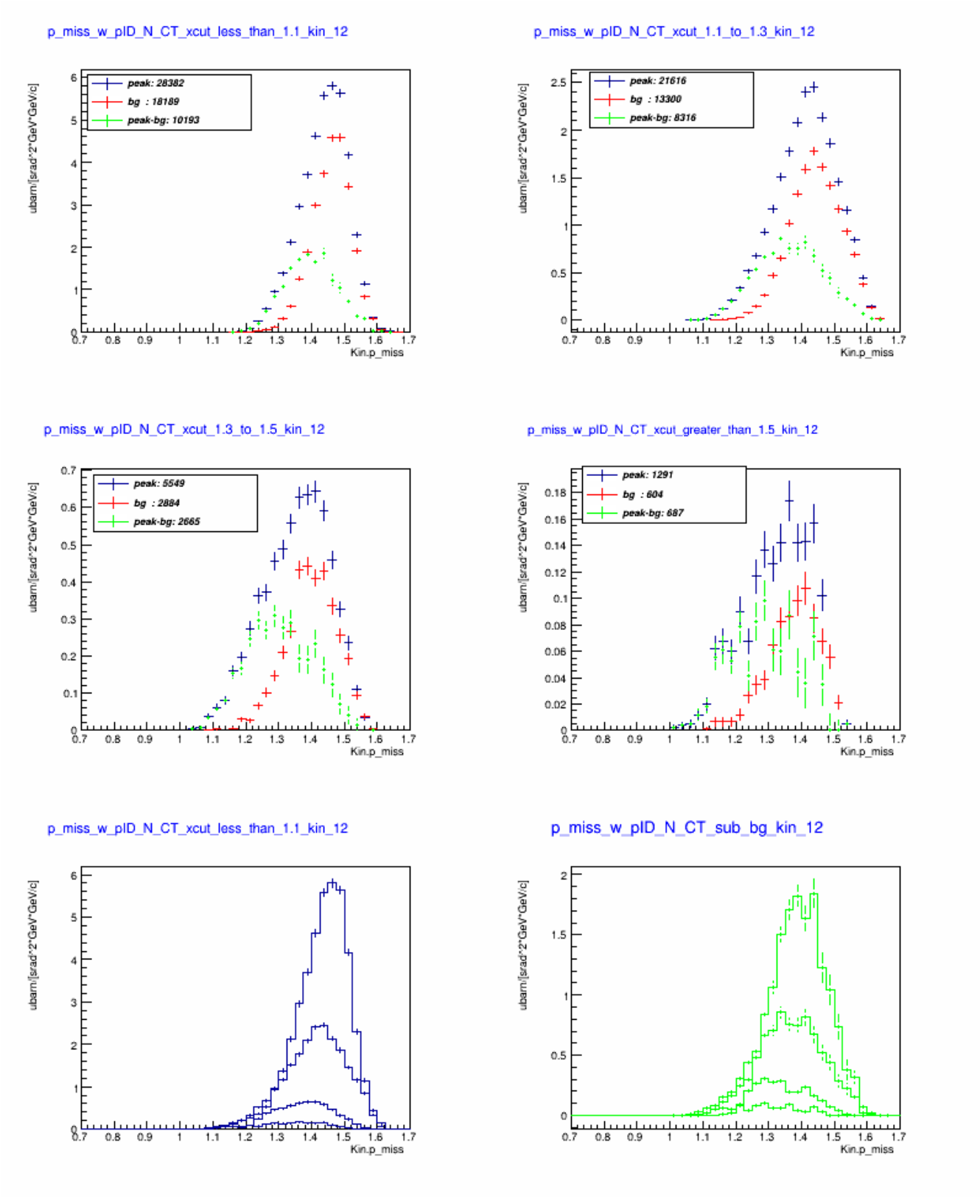
The modification of the range of E_electron is adjust to each Xcut range.



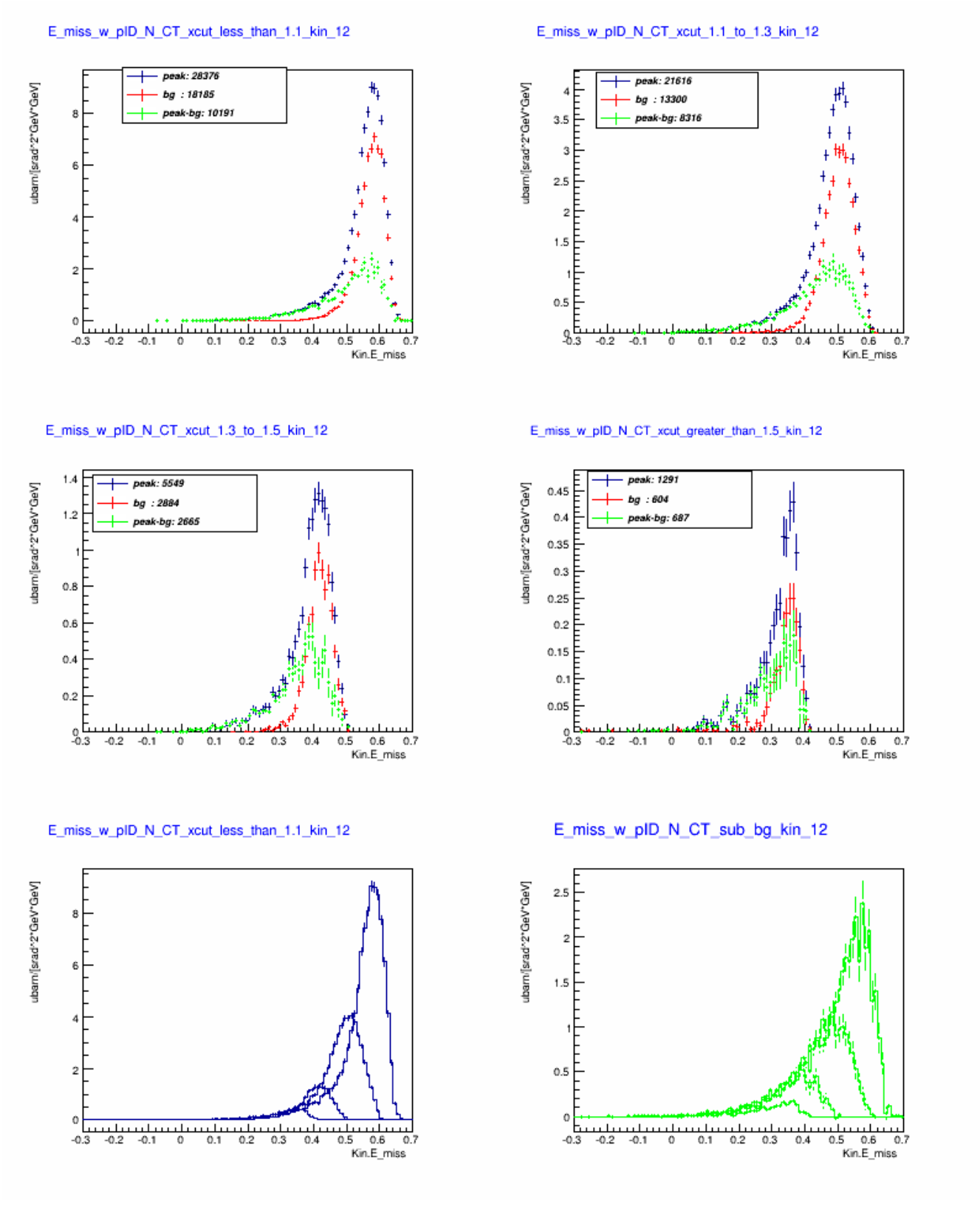
Kin 12: p_MWDC cross section per each Xcut



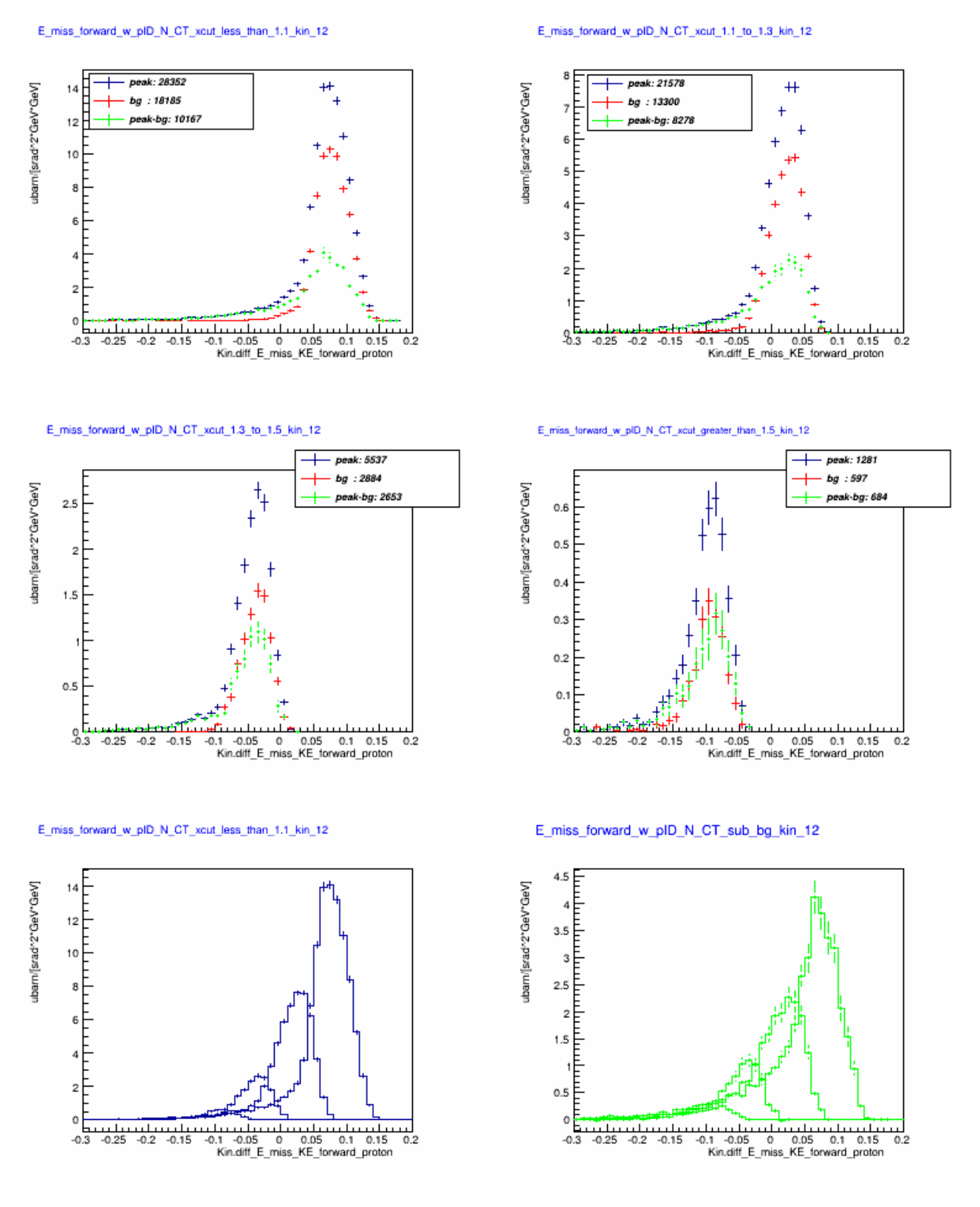
Kin 12: p_target cross section per each Xcut



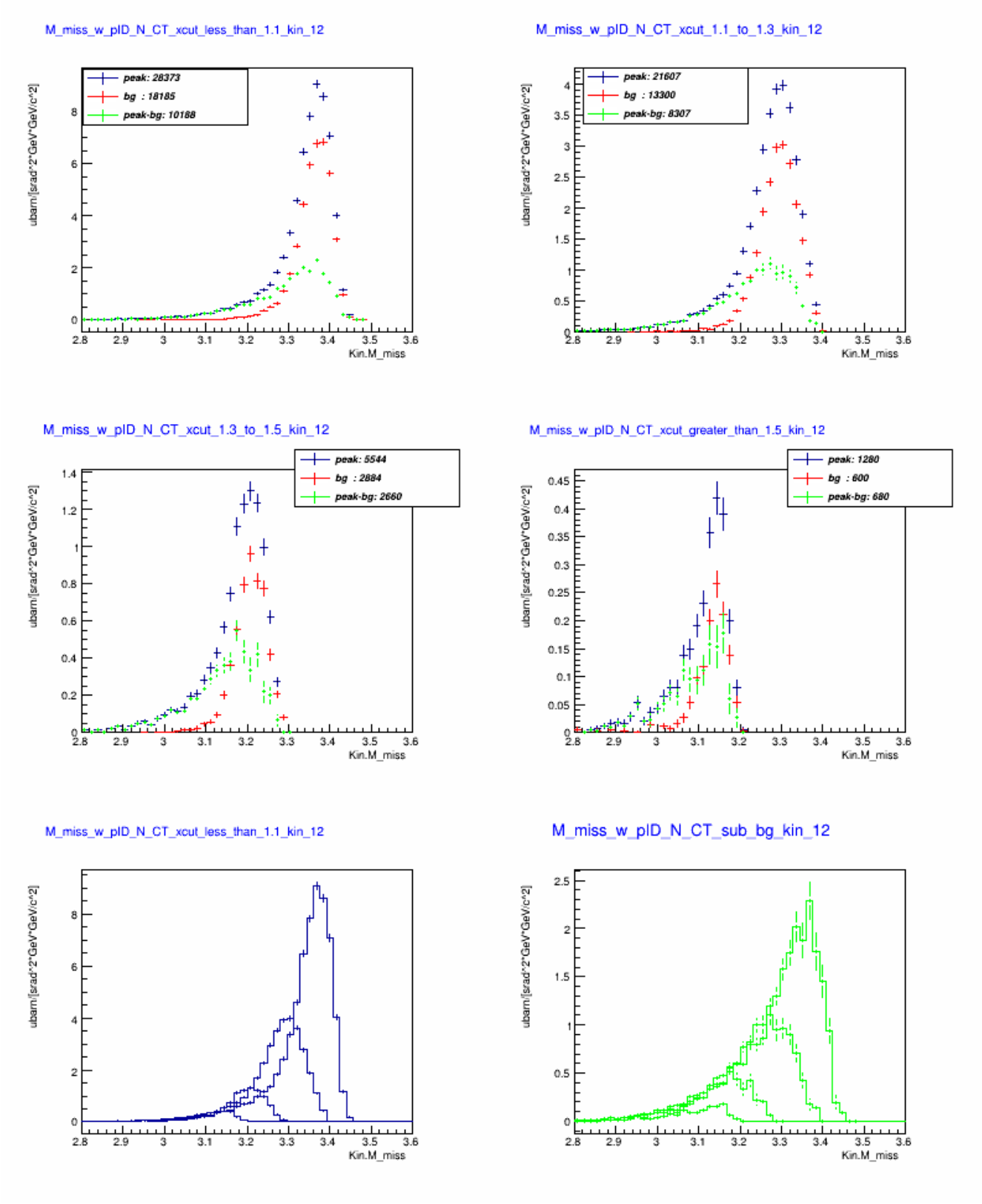
Kin 12: P_miss cross section per each Xcut



Kin 12: E_miss cross section per each Xcut

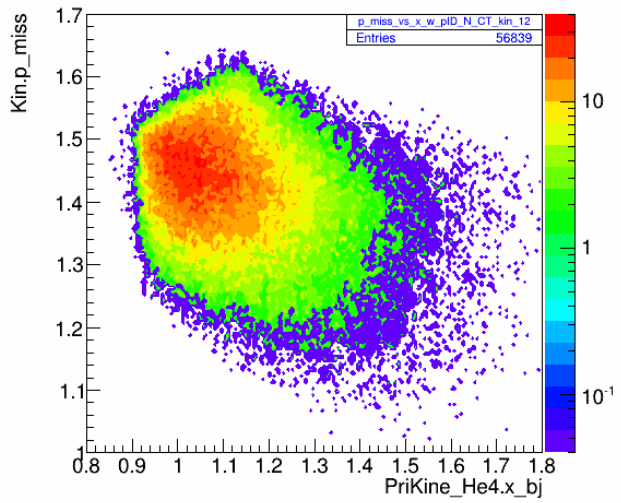


Kin 12: E_miss forward cross section per each Xcut



Kin 12: M_miss cross section per each Xcut

p_miss_vs_x_w_pID_N_CT_kin_12



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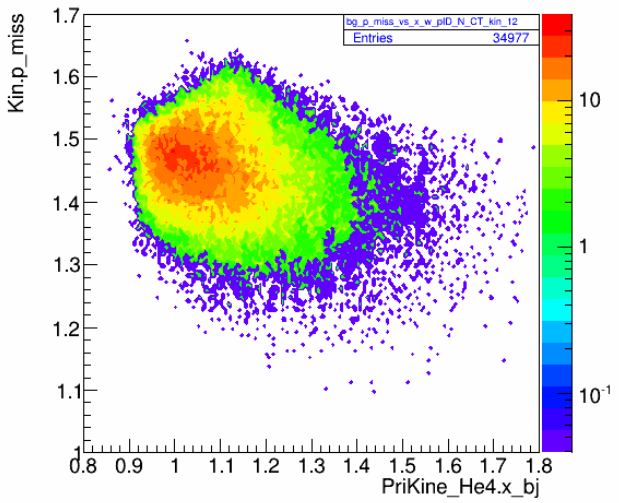

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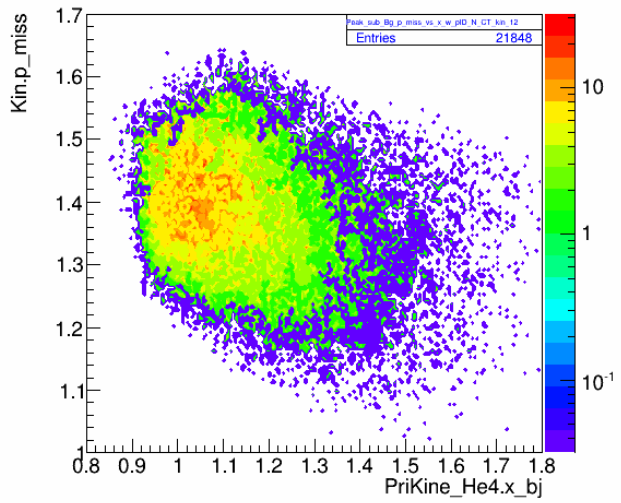

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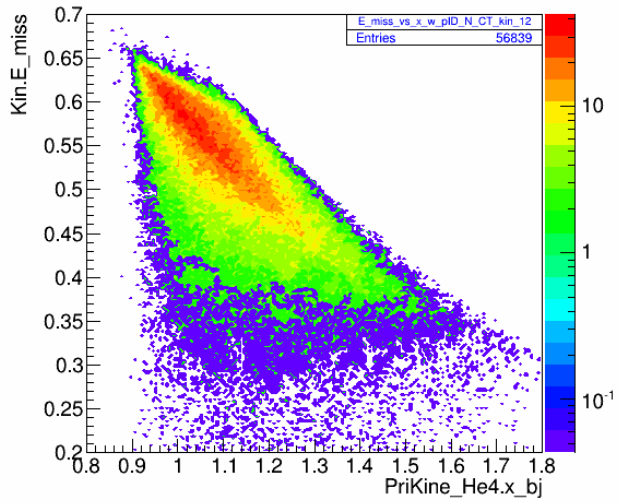

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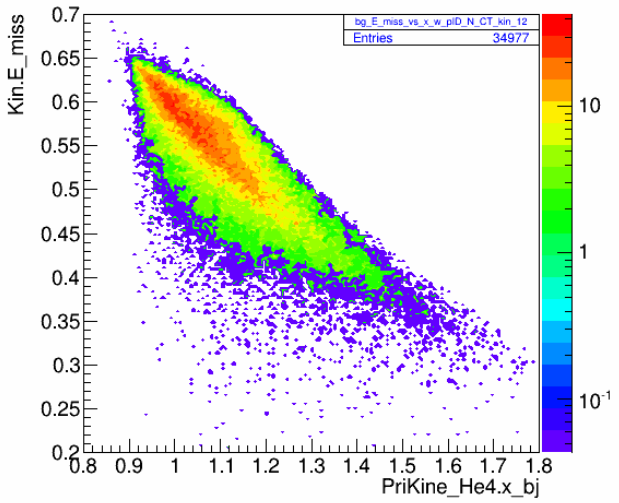

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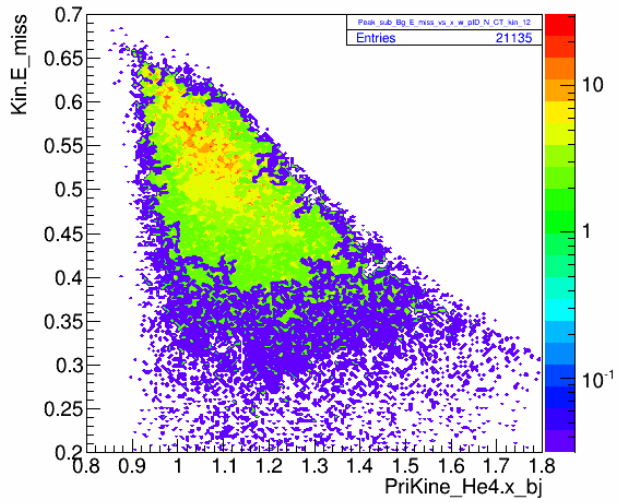

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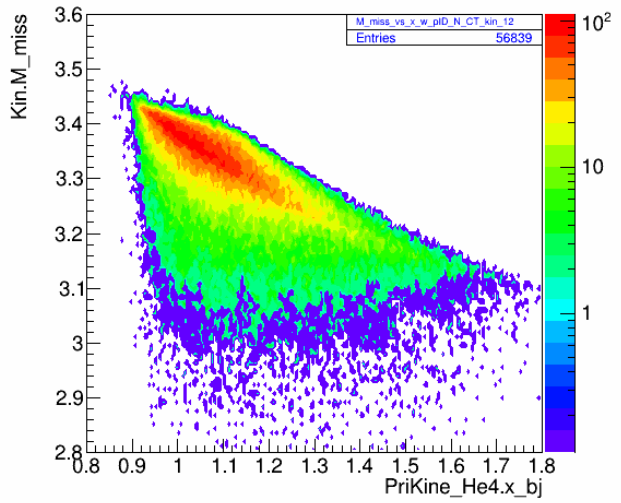

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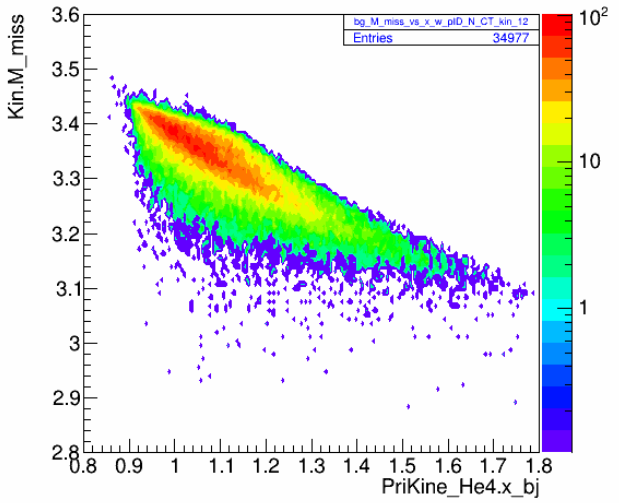

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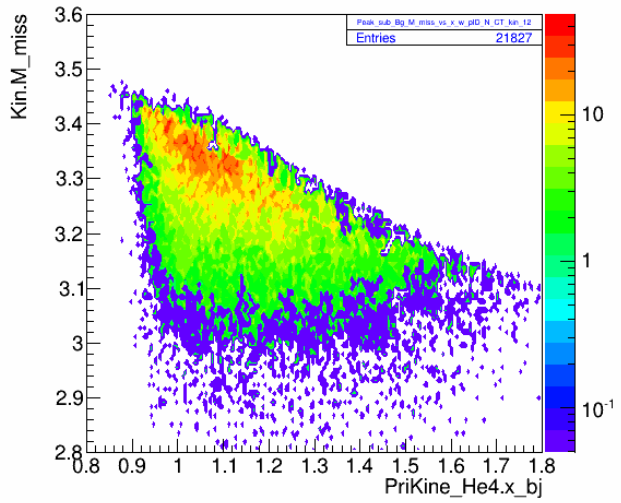

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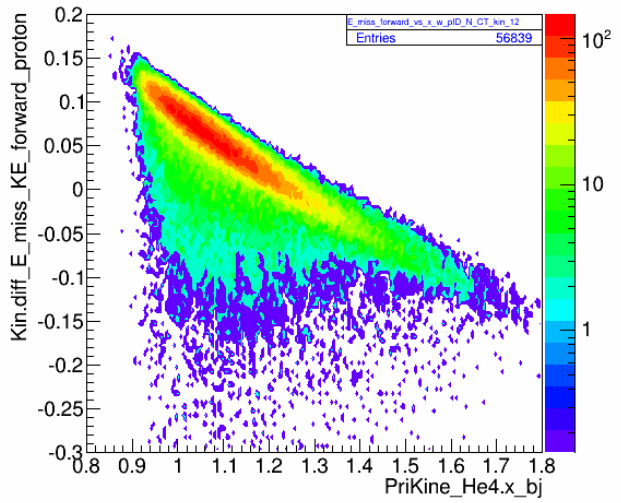

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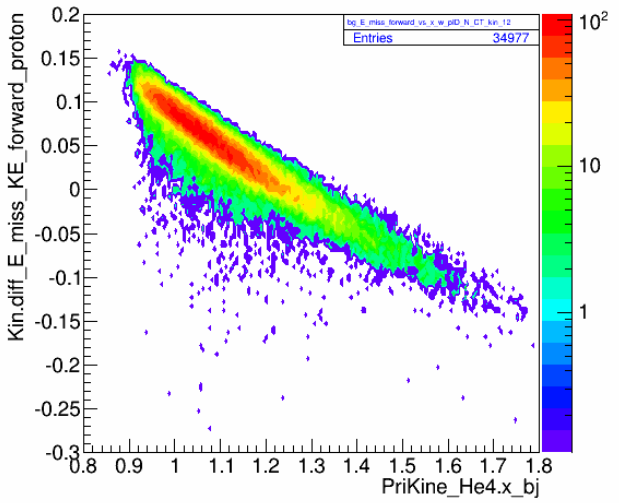

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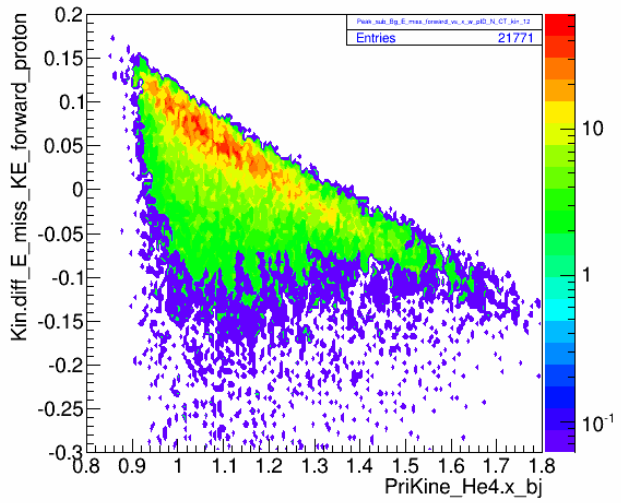

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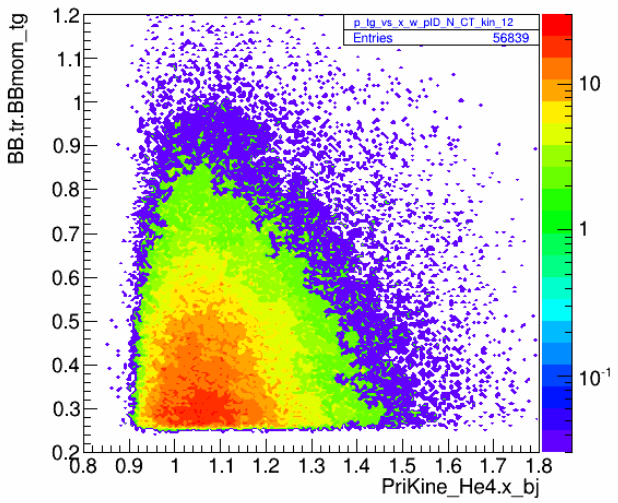

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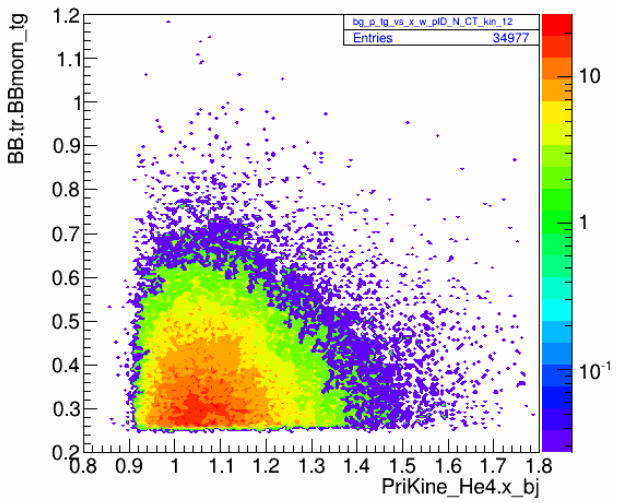

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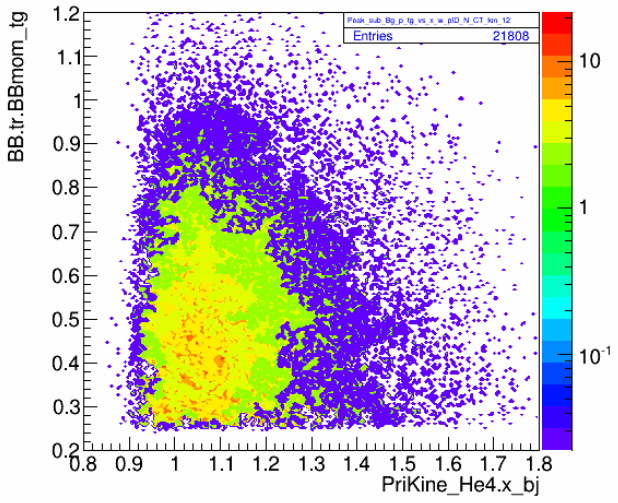

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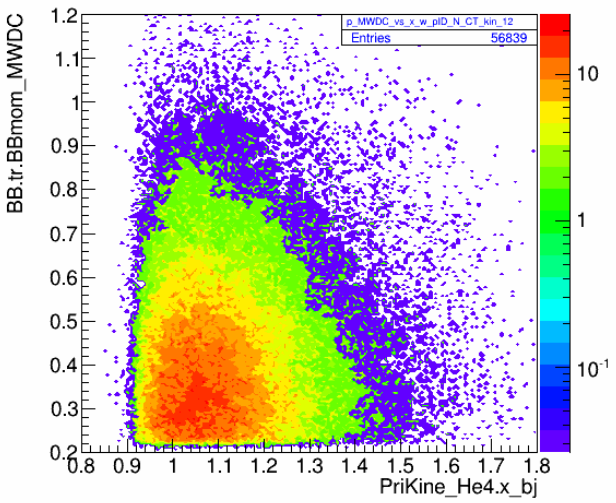

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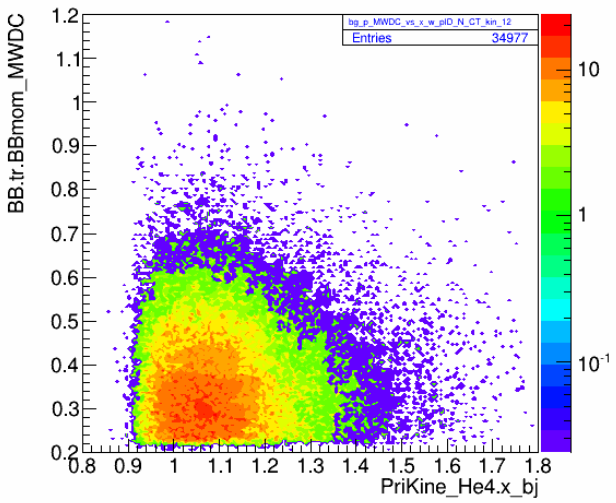

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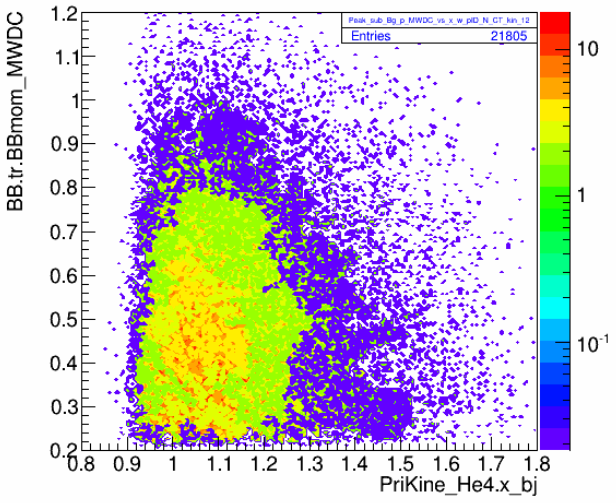

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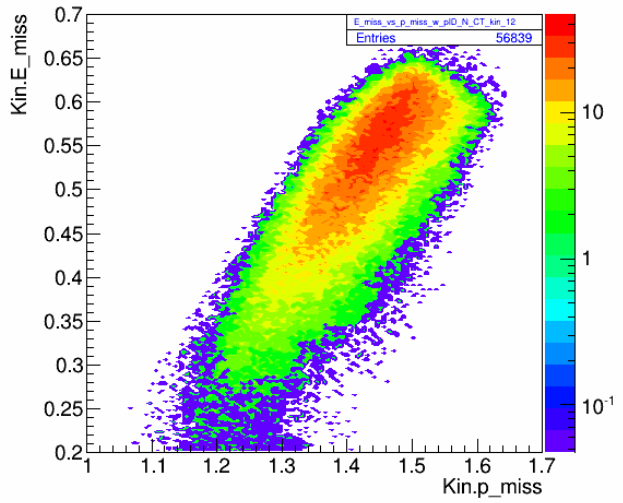

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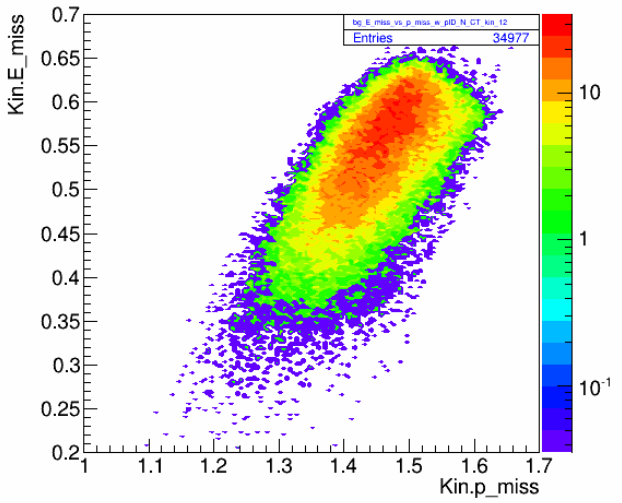

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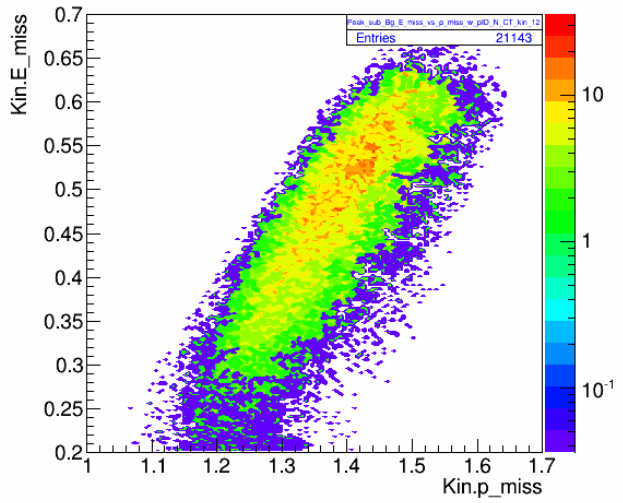

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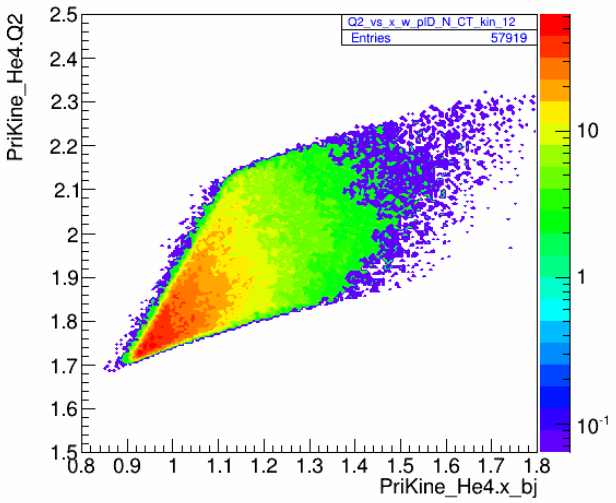

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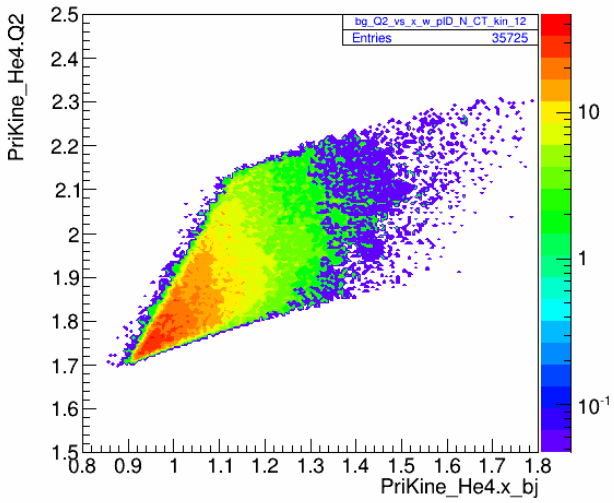

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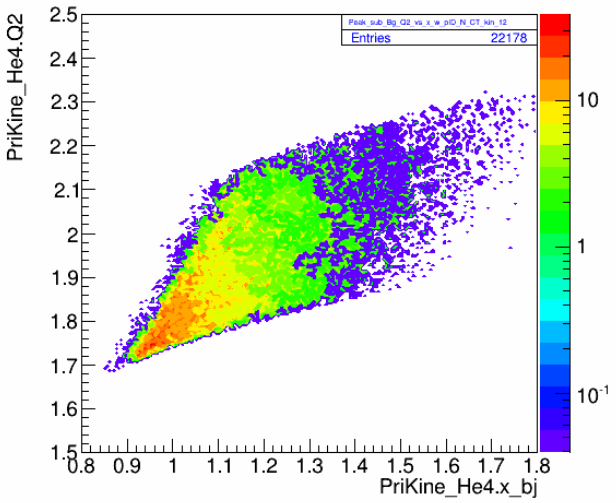
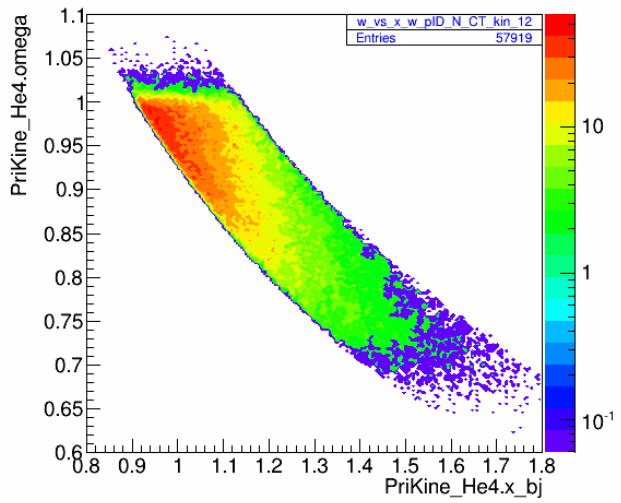


w_vs_x_w_pID_N_CT_kin_12



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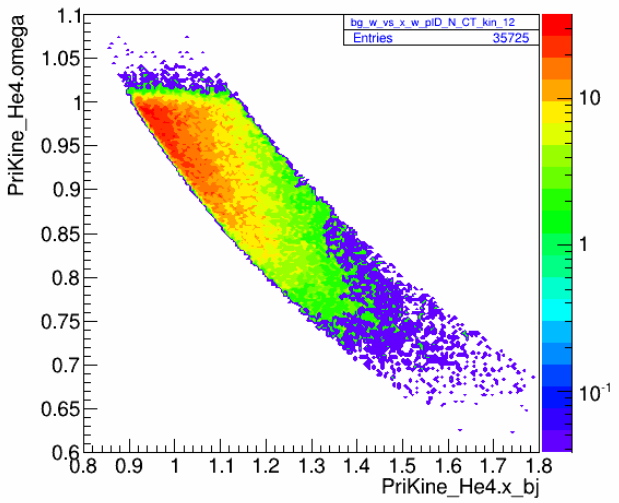

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