Inclusive Ratio.

Cut_1: T3 no edtm |L_theta|<=0.06 && |L_phi|<=0.03

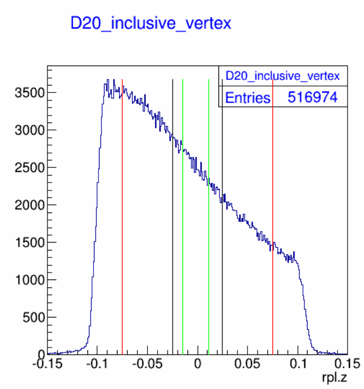
Cut_2: electron PID: with (prl_sum_E/p)>=0.7 && single track in LHRS

Cut_3: End-cap (vertex) cut:
D-20cm: at |rpl.z|<=7.5 cm
D-10cm: at |rpl.z|<=2.5 cm
He-20cm: at |rpl.z|<=7.5 cm
C-slated: at |rpl.z+0.16|<=1.30 cm (3*sigma fit)

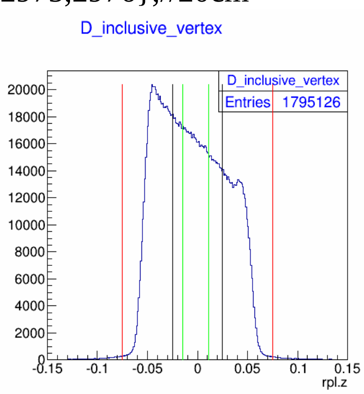
Table 1:

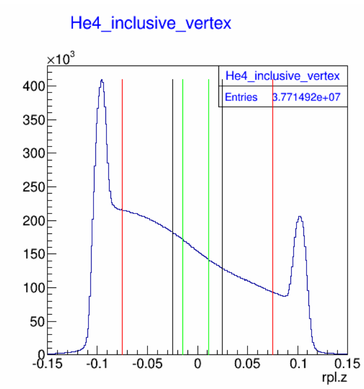
Comparing targets	End-cap (vertex) cut & vertex data selection
D-20cm & He-20cm	at |rpl.z|<=7.5 cm (red-line)
D-10cm & He-20cm	at |rpl.z|<=2.5 cm (black-line)
(He || D)& C-slated	at |rpl.z+0.16|<=1.30 cm (green-line)

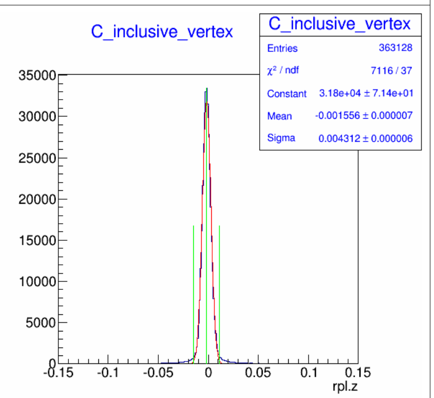
Table 2:

<table>
<tr><th>D2</th><th>He4</th><th>C12</th></tr>
<tr>
<td>


V1:
int runlist_D20[2] = {2975,2976};//20cm



V2:
int runlist_D10[8] = {3171,3172,3173,3174,3175,3176,3177,3178};//10cm
</td>
<td>


V3:
All kin 12 data
</td>
<td>


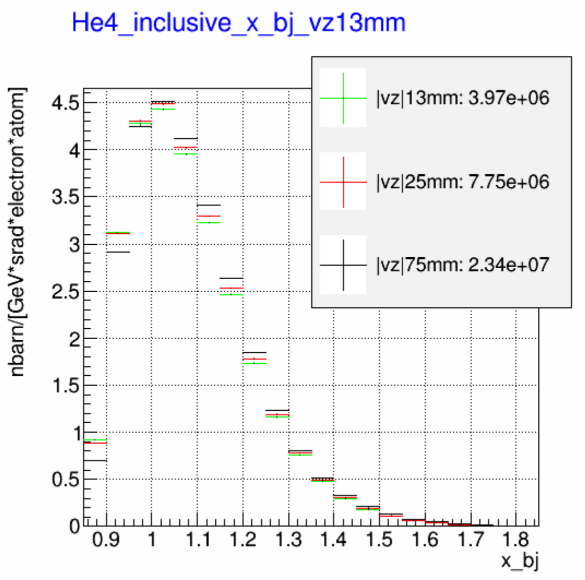
V4:
runlist_C[] = {2977,2979,2981}

the target is 0.25mm(??) thick with 20 degree slated.
The area-density = 0.0419+/-0.0005 g/cm^2 if 90 degree to the beam.
But with slated angle, we have to modify the area-density (where the beam seen) with 0.0419/sin(20)
</td>
</tr>
</table>

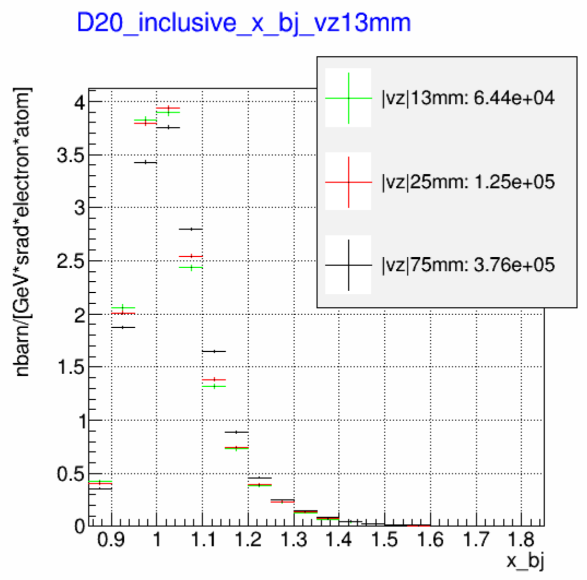
Now we can calculate cross section with the following parameters.
Table 3:

		Ld2 (10cm) (3171-78)	He4 Kin12	C12 (2977,2979,2981)	Ld2 (20cm) (2975-6)
parameter	**unit**	**value**	**value**	**value**	**value**
Target Density	g/cm^3	0.168	0.034	0.0419 g/cm^2	0.168
Target Length	cm	5	15	*add: 1/sin(20 deg)	15
(Target Density)*(target Length)	g/cm^2	0.838	0.508	0.123	2.513
N_A	atom/mol	6.020E+23	6.020E+23	6.020E+23	6.020E+23
A_z	g/mol	2	4	12	2
(Target Density)(target Length)*N_A/A_z*	*(g/cm^3)*(cm) *(atom/mol)*(mol/g) =atom/cm^2*	*2.52E+23*	*7.64E+22*	*6.15E+21*	*7.57E+23*
Total Charge	C	3.89E-02	2.27E+00	1.55E-01	6.50E-03
Electron charge	C/electron	1.60E-19	1.60E-19	1.60E-19	1.60E-19
N_electron = (Total Charge)/(electron charge)	*(C)/(C/electron) =electron*	*2.43E+17*	*1.42E+19*	*9.68E+17*	*4.06E+16*
N_electron_target_area_number_density = [(Total Charge)/(electron Charge)] *[(Target Density)*(target Length)*N_A/A_z]	**electron*atom*cm^-2**	**6.13E+40**	**1.09E+42**	**5.95E+39**	**3.07E+40**
dE_electron	GeV	0.31	0.31	0.31	3.100E-01
sin(L_angle)		0.347	0.347	0.347	0.347
L_theta	rad	0.12	0.12	0.12	0.12
L_phi	rad	0.06	0.06	0.06	0.06
dE_e*d2_omega_e = dE_electron*sin(L_angle)*L_theta*L_phi	**GeV*srad**	7.744E-04	7.744E-04	7.744E-04	7.744E-04
Factor = (dE_e*d2_omega_e)^-1* (N_electron_target_area_number_density)^-1	**Cm^2 ------------------------------------- [GeV*srad*electron*atom]**	2.106E-38	1.190E-39	2.172E-37	4.201E-38
[1 Barn = 1e-24 cm^2]	**barn ------------------------------------- [GeV*srad*electron*atom]**	2.106E-14	1.190E-15	2.172E-13	4.201E-14
[1 nBarn = 1e-33 cm^2]	**nbarn ------------------------------------- [GeV*srad*electron*atom]**	**2.106E-05**	**1.190E-06**	**2.172E-04**	**4.201E-05**
	cross section = factor *N_pass_cut				

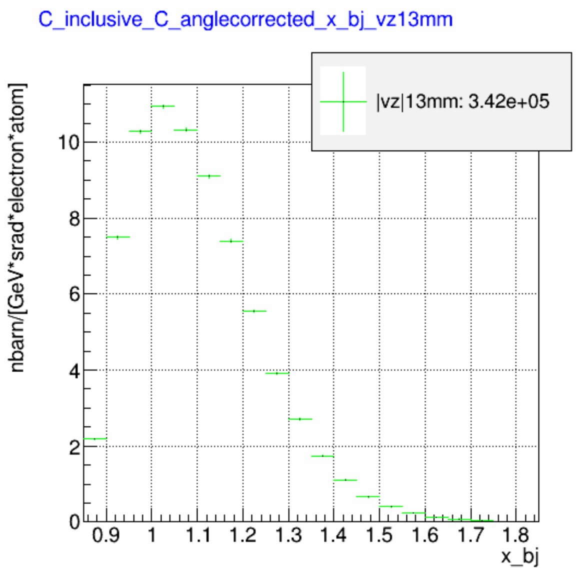
Table 4: The Inclusive cross section in x_bj distribution for He4, C and D.



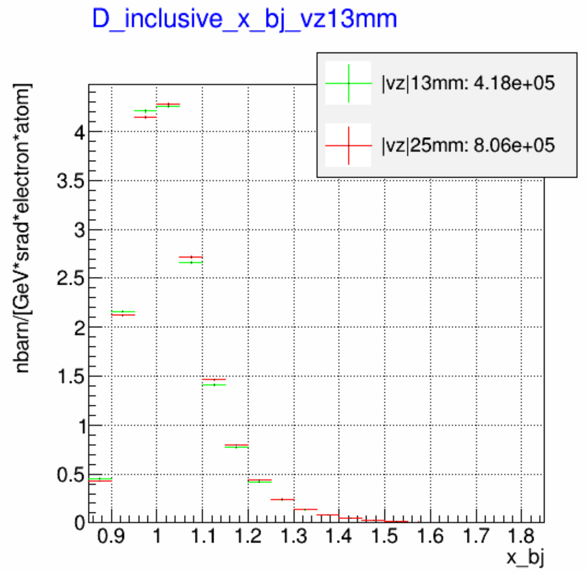
X1:
Inclusive Cross Section for He4



X2:
Inclusive Cross Section for D (20-cm size)

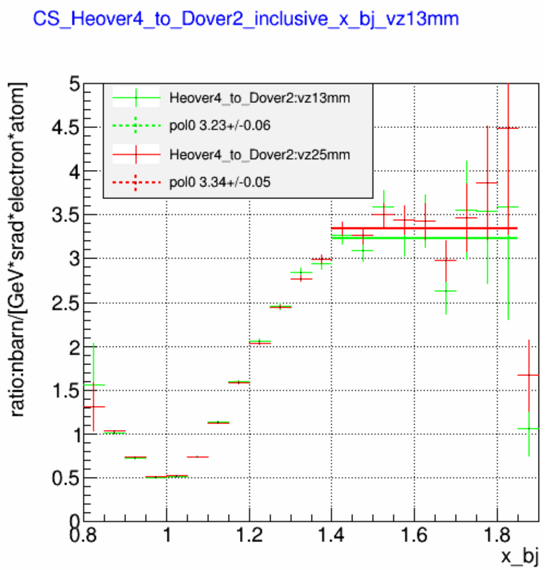


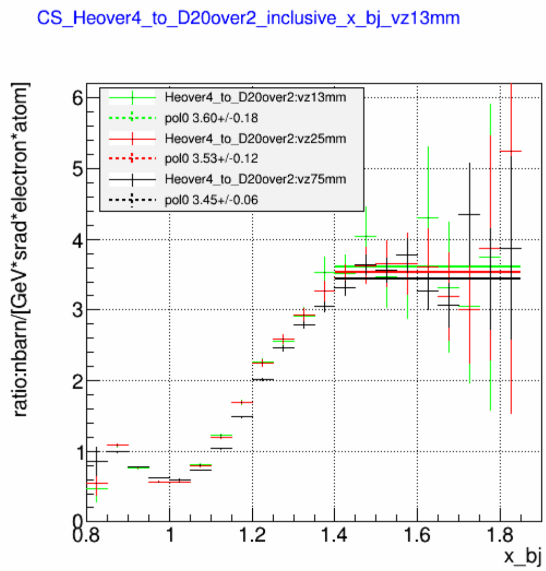
X3:
Inclusive Cross Section for C

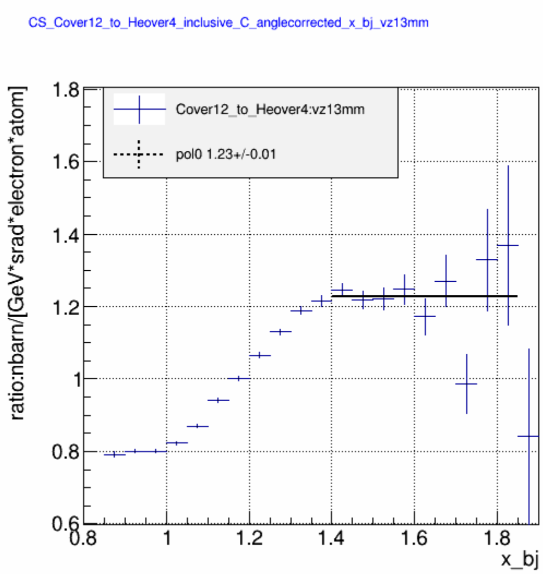


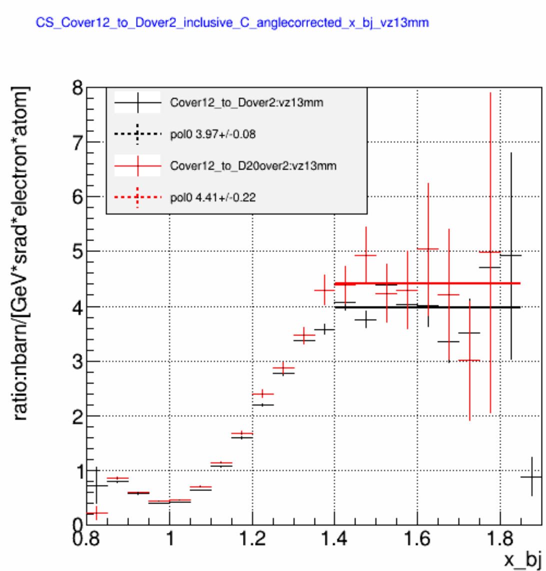
X4:
Inclusive Cross Section for D (10-cm size)

Table 5: Inclusive Cross section ratio for C12, He, D

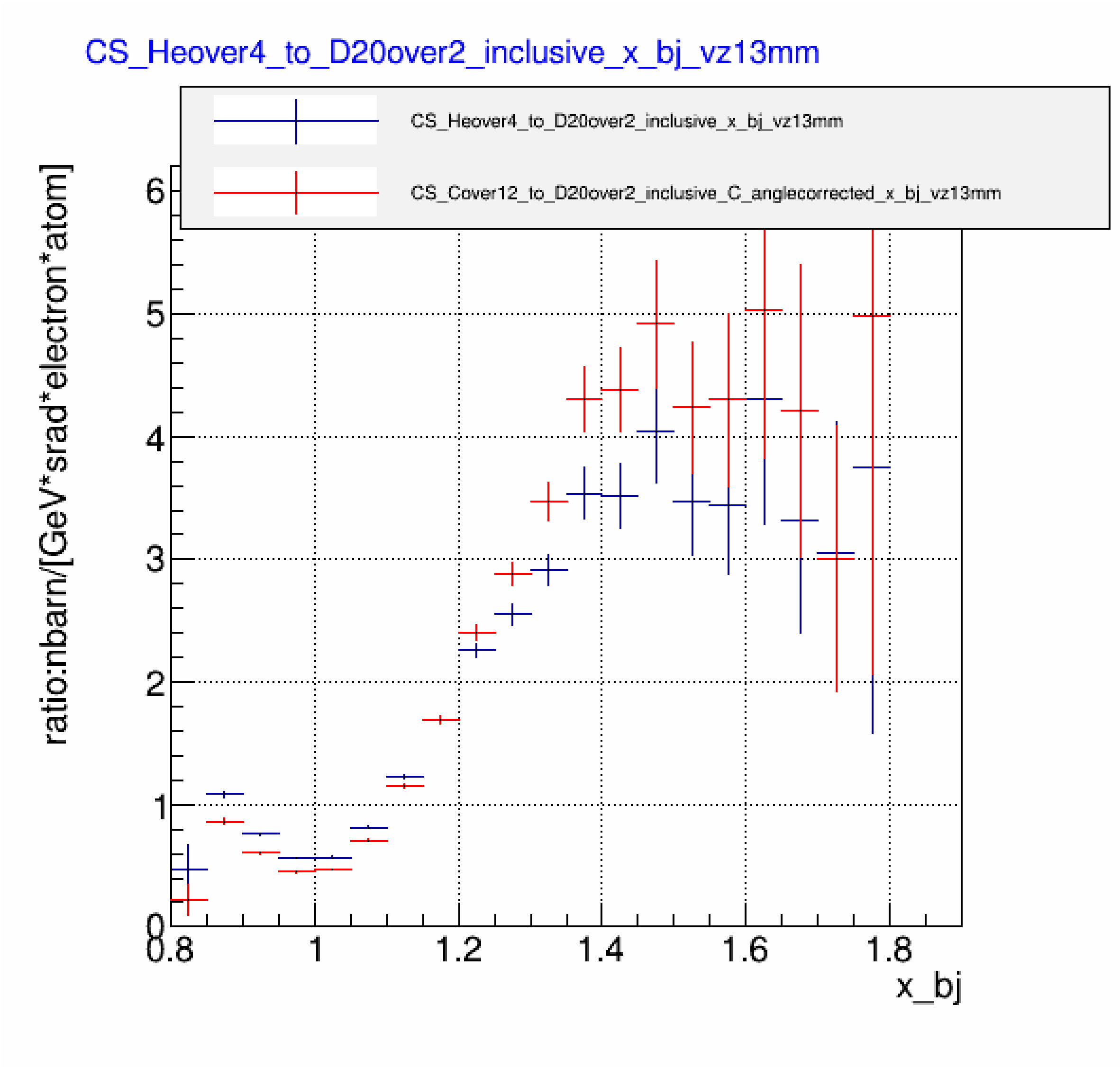
<table>
<tr>
<td>


R1:He/4 to D/2 (10cm-length)
give a2 pol0 3.23+/-0.06 (fit-only)
pol0 3.34+/-0.05
compare to a2(He) at 3.60*
{N. Fomin et al, physi. Rev. Lett 108, 092502(2012)}
</td>
<td>


R2:He/4 to D/2 (20cm-length)
give a2 pol0 3.60+/-0.18
pol0 3.53+/-0.12
pol0 3.45+/-0.06
compare to a2(He) at 3.60*
</td>
</tr>
<tr>
<td>


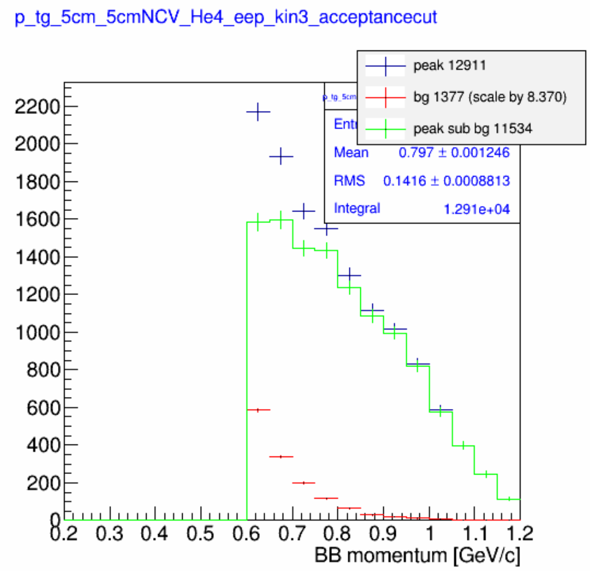
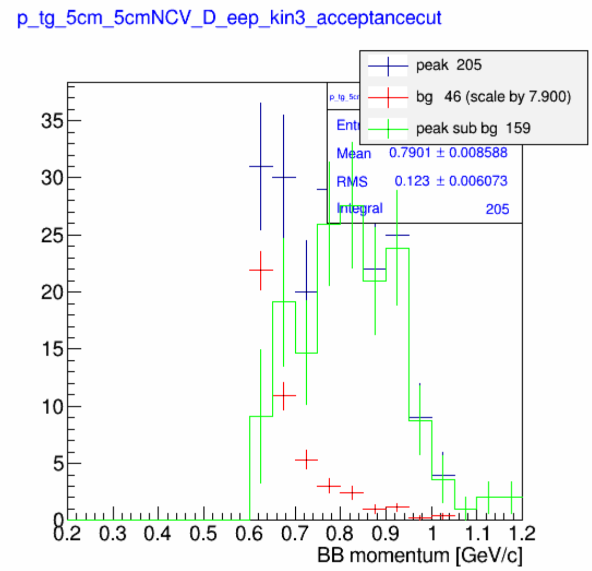
R3:
C/12 to He/4
give flat region at pol0 1.23+/-0.01
</td>
<td>


R4:
C/12 to D/2
give a2 pol0 3.97+/-0.08
pol0 4.41+/-0.22
compare to a2(C) at 4.75*
</td>
</tr>
</table>

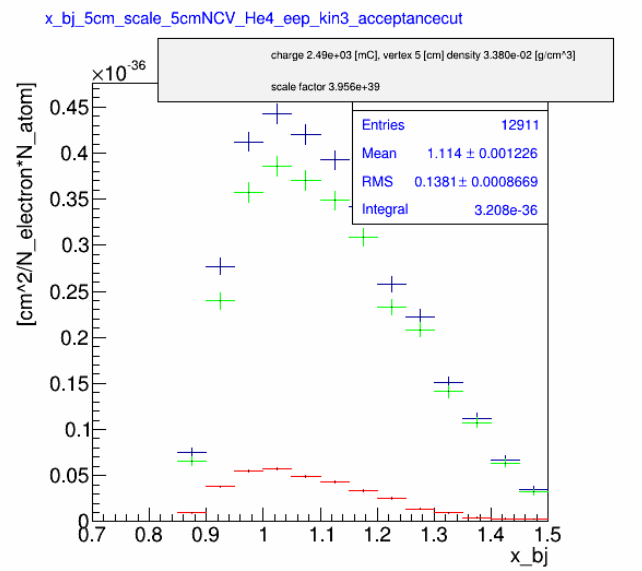


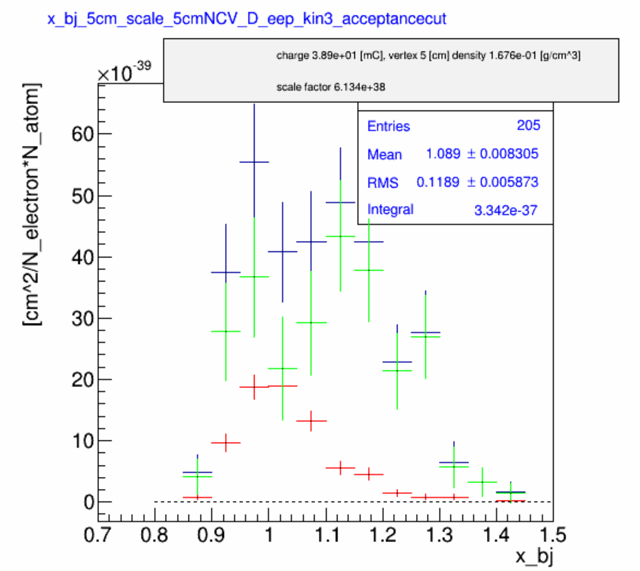
R5: this show the possibility that we have the flat region around 1 for C12/He4 ratio.

Semi-inclusive:D and He
with proton-momentum>600 MeV/c (region where the coincidence time (CT) background are very low

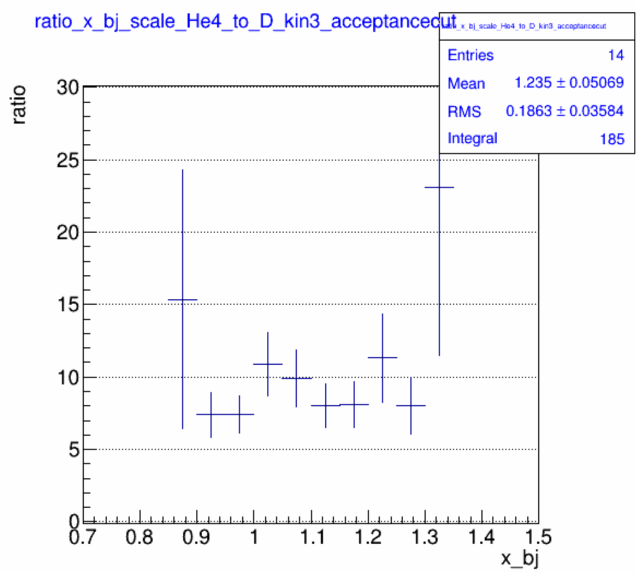
	
He data Momentum distribution selection >600 MeV/c	D data

We have the distribution of x_bj as:



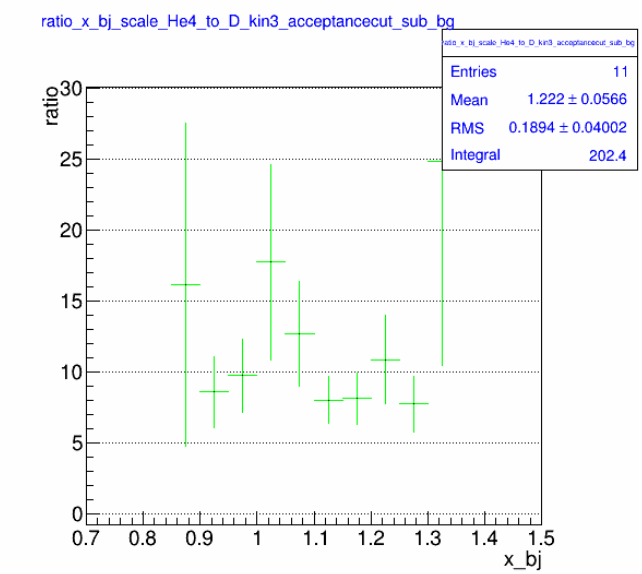


With the restrain on the momentum range (i.e. at p_tg>0.6 GeV/c) where the background is very low.



Even without background subtracted the flat region can be seen.

with the restrain on the momentum range (i.e. at p_tg>0.6 GeV/c) where the background is very low and does not change according to the cut of the coincidence time window in subtracting the background.



The ratio is quite flat

Next to do is with the C to He