

VTX Track Resolution with Beam background Overlay

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Background events : types and timings

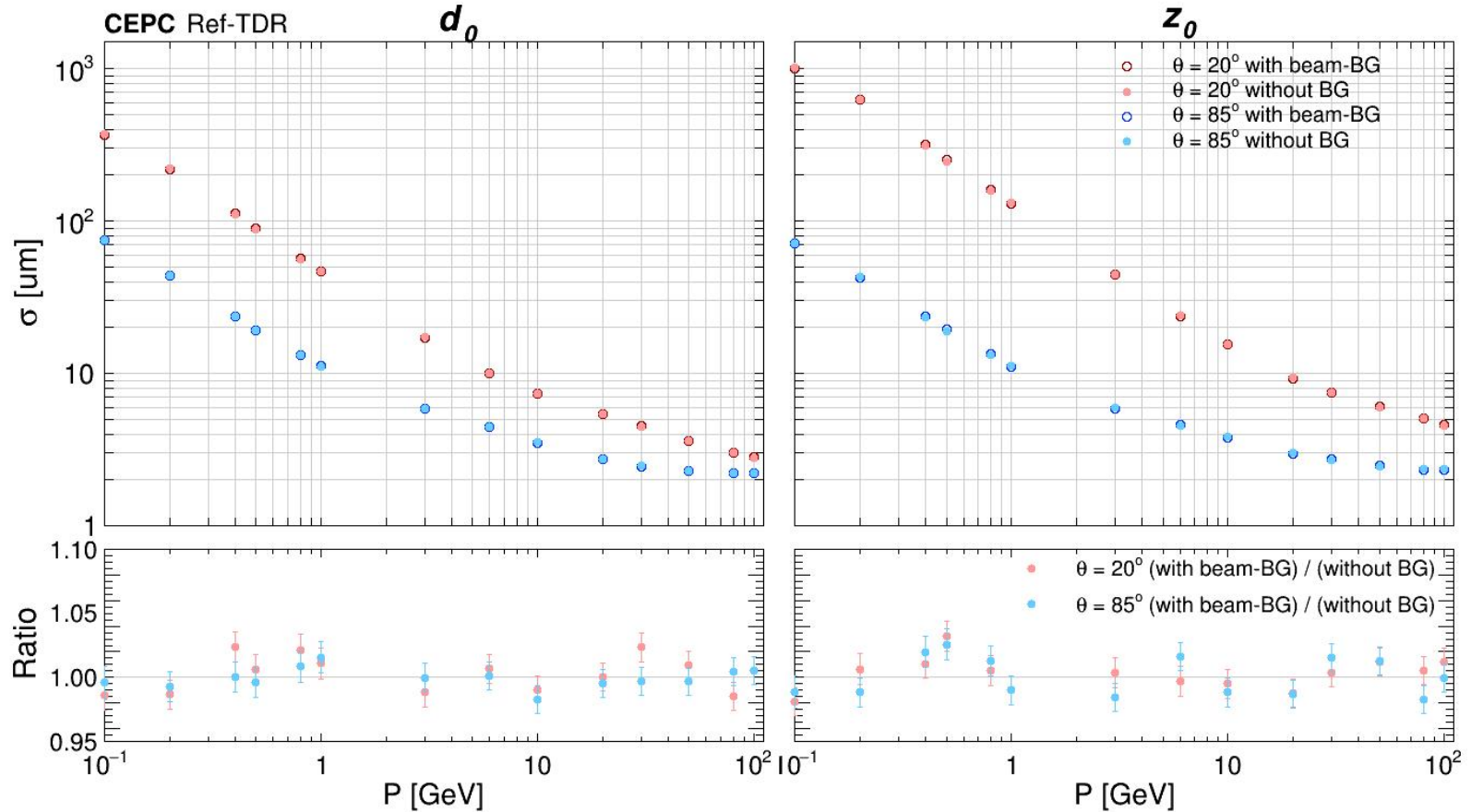
背景类型	时间参数	模式类型	物理意义
Pair(Pair production)	-2770	固定时间窗口	事件间隔 2770ns
BGB(Beam-Gas Bremsstrahlung)	4145.41	采样模式 (速率)	每秒发生 4145.41 次 (Hz)
BGC(Beam-Gas Coulomb)	87781.62	采样模式 (速率)	每秒发生 87781.62 次 (Hz)
BTH(Beam-Thermal Photon)	357.20	采样模式 (速率)	每秒发生 357.20 次 (Hz)
TSC(Touschek Scattering)	103.77	采样模式 (速率)	每秒发生 103.77 次 (Hz)

topdir : /cefs/higgs/shihy/tools/CEPCSW_TDR255/CEPCSW/Test/Higgs
version : 250515

- updated:/cefs/higgs/shihy/tools/CEPCSW_TDR258/CEPCSW/Test/Higgs/Pair_250823(cut不同)

d_0 and z_0 Resolution : With vs. Without Background

- Key Metrics:
 - d_0 : Transverse impact parameter resolution.
 - z_0 : Longitudinal impact parameter resolution.
- Entries : 10000



- There is **no noticeable degradation** in the resolution of d_0 and z_0 at polar angles of 85° and 20° across the momentum range from 0.1 to 100 GeV.

Sigma of z0 at 20° (100-200MeV)

Pair Production:0515

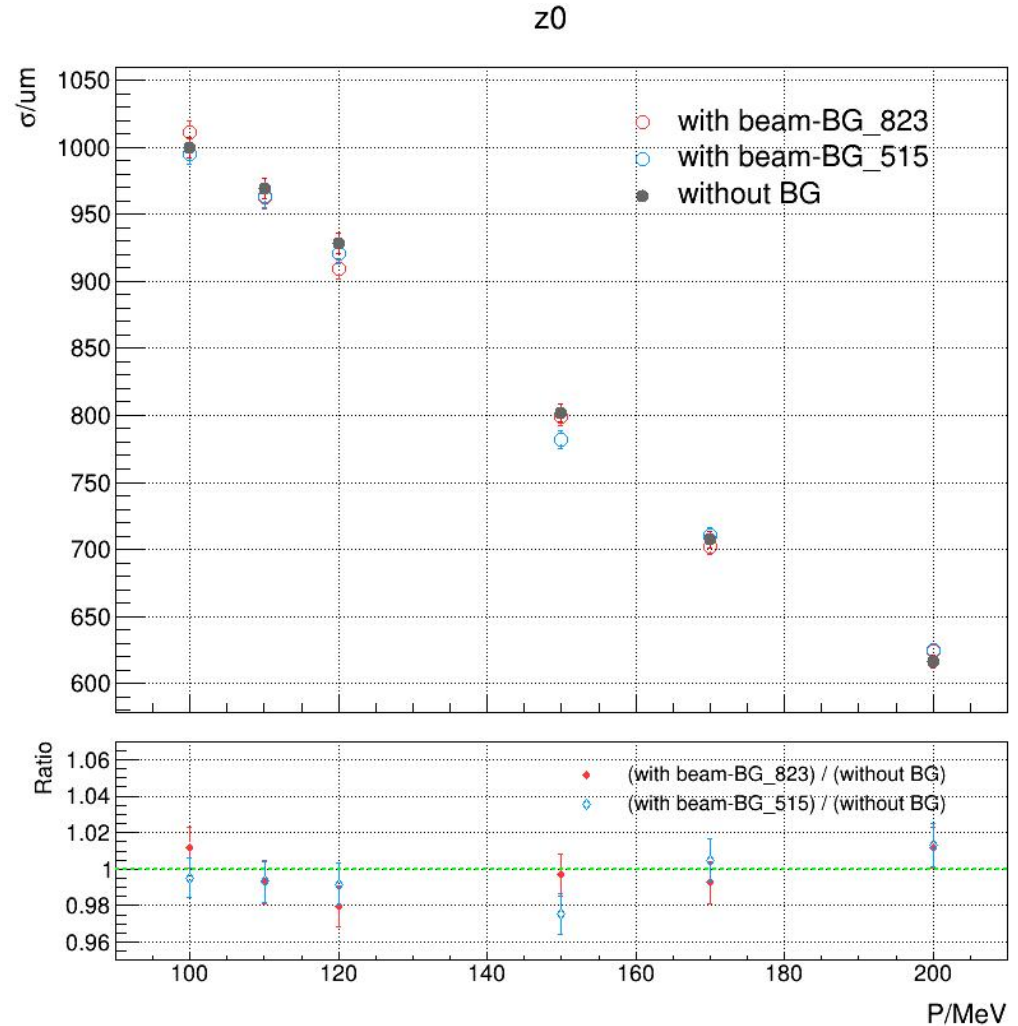
P/MeV	sigma(μm)	error(μm)
100	994.818	7.69868
110	963.014	7.9189
120	920.904	7.68429
150	781.717	6.38922
170	710.832	5.88379
200	624.534	5.17185

Pair Production:0823

P/MeV	sigma(μm)	error(μm)
100	1015.46	8.42591
110	980.796	8.07265
120	920.602	7.30881
150	799.22	6.53018
170	717.251	5.9301
200	622.221	5.15145

No background

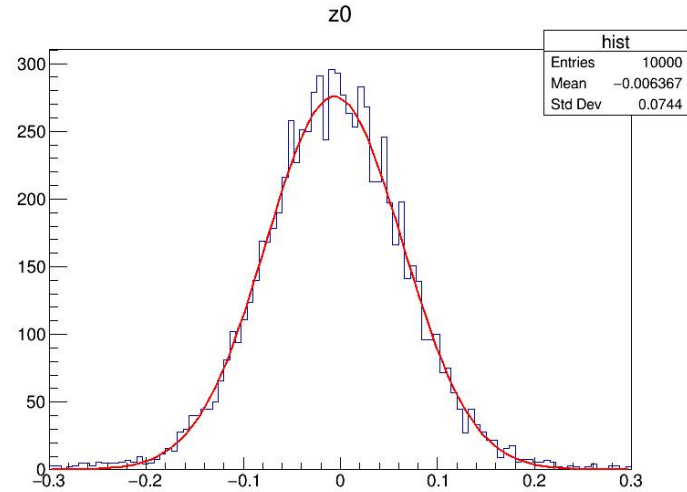
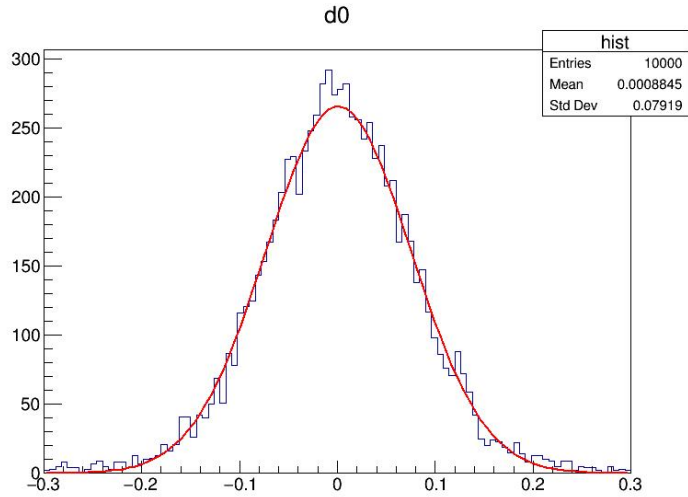
P/MeV	sigma(μm)	error(μm)
100	1015.37	8.01231
110	961.078	7.81041
120	933.602	7.63063
150	782.192	6.34349
170	718.253	5.79888
200	623.39	5.15279



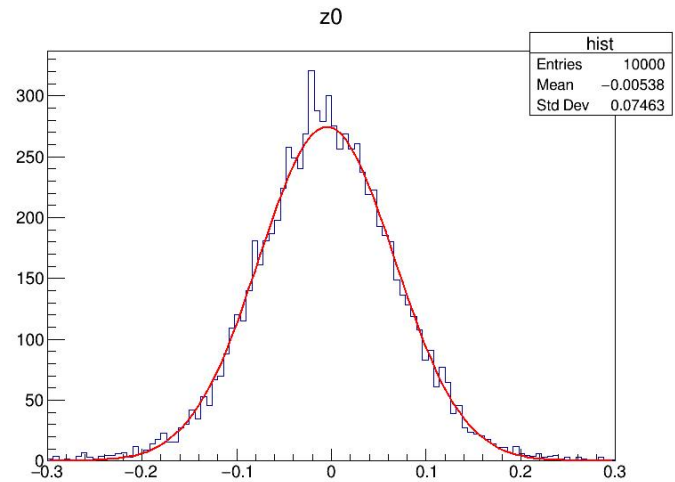
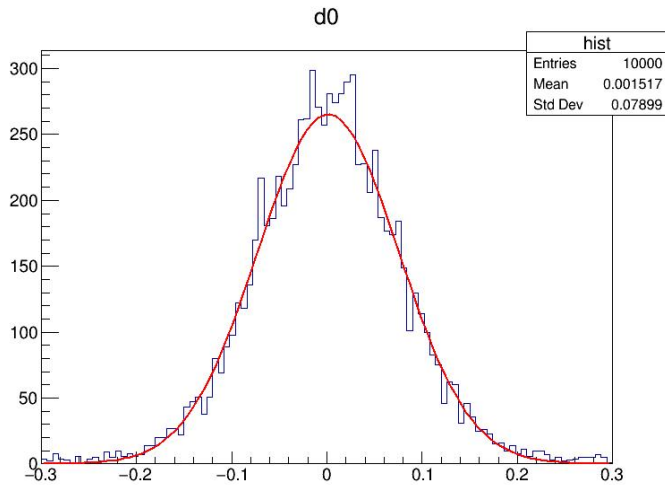
- BG_823 shows more prominent deviations in the low-momentum region.

Backup

- with beam-BG (Pair :250515) (100MeV,85°)

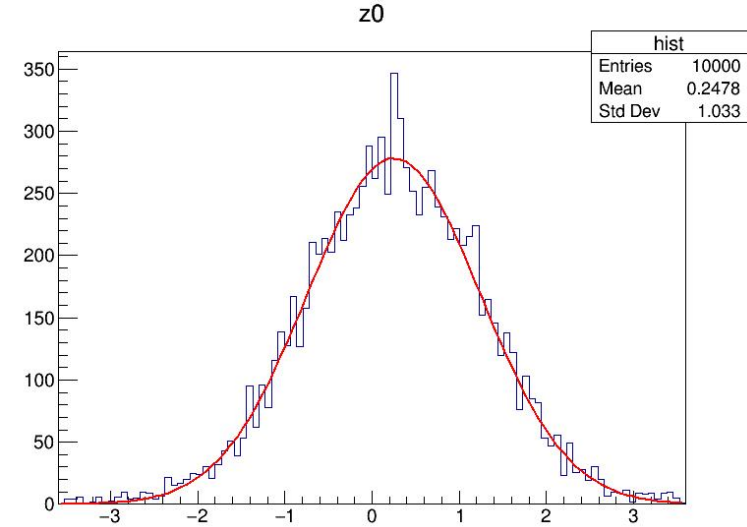
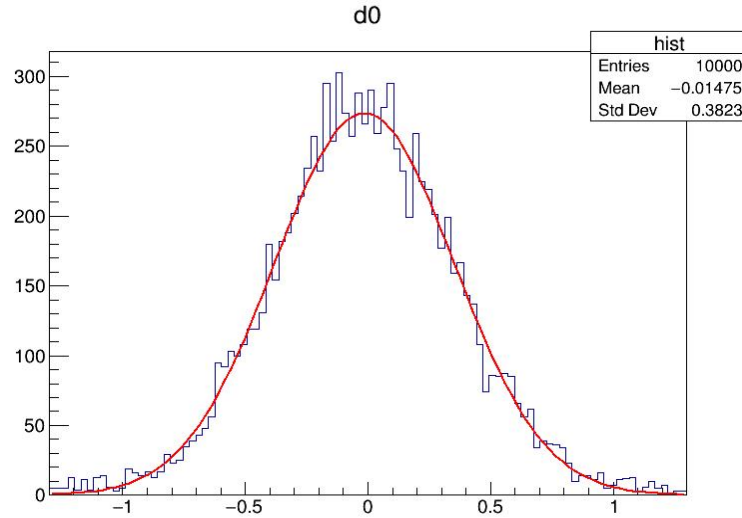


without BG (100MeV,85°)

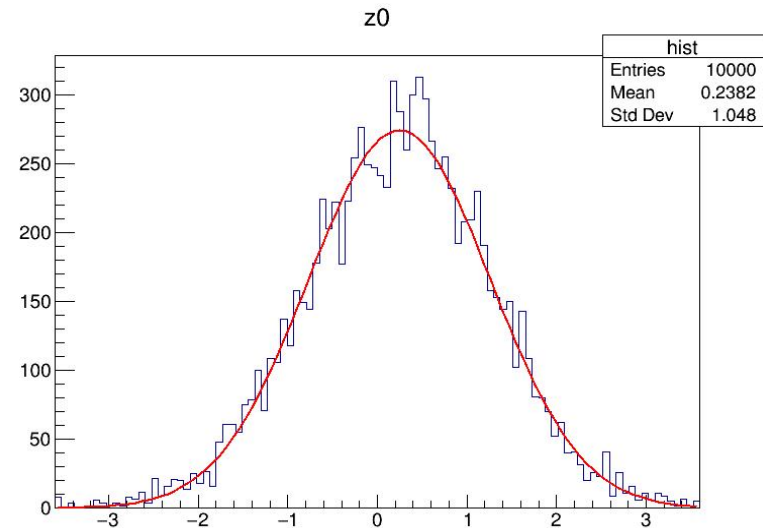
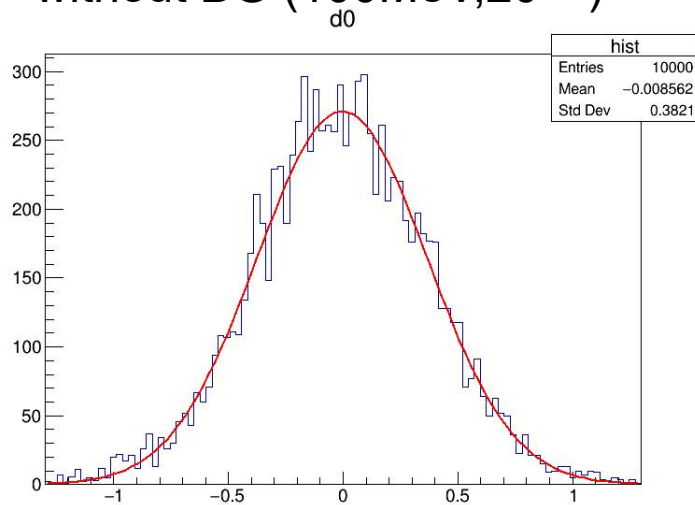


Backup

with beam-BG (Pair :250515)(100MeV,20°)



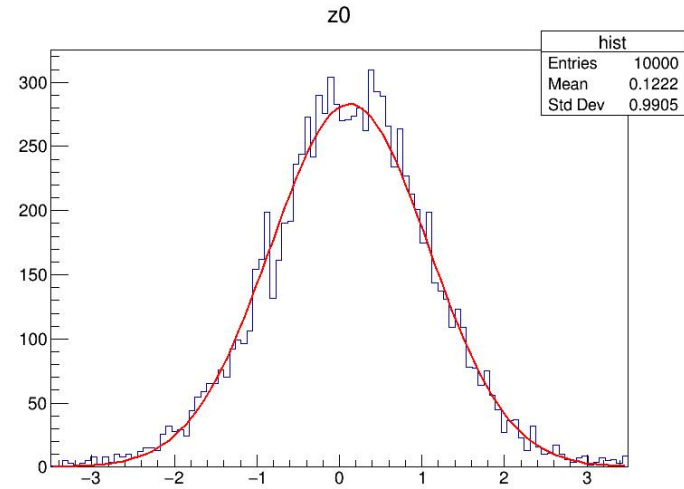
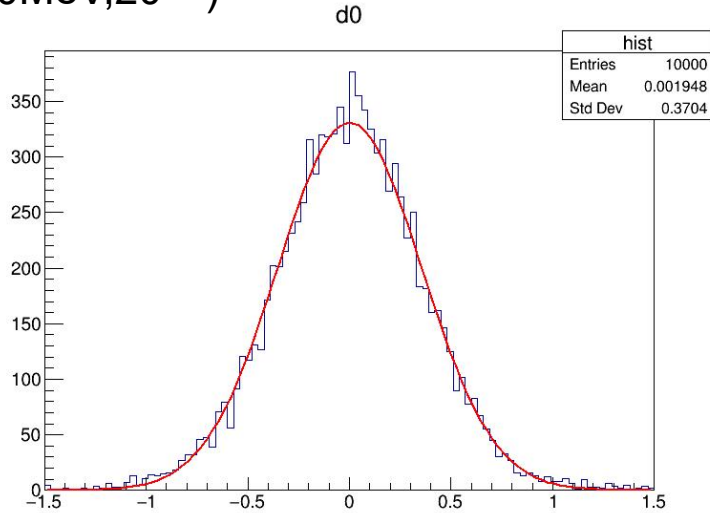
without BG (100MeV,20°)



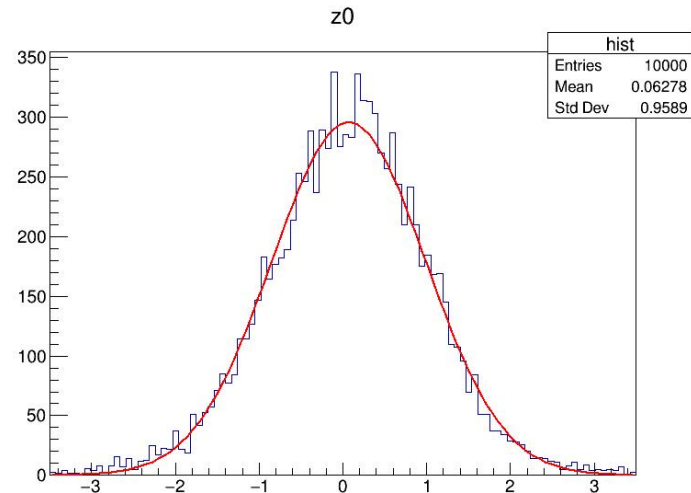
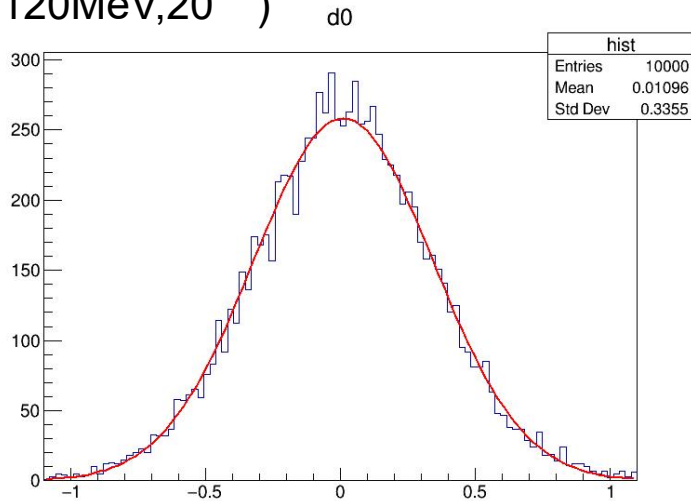
Backup

with beam-BG (Pair :250515)

(110MeV,20°)



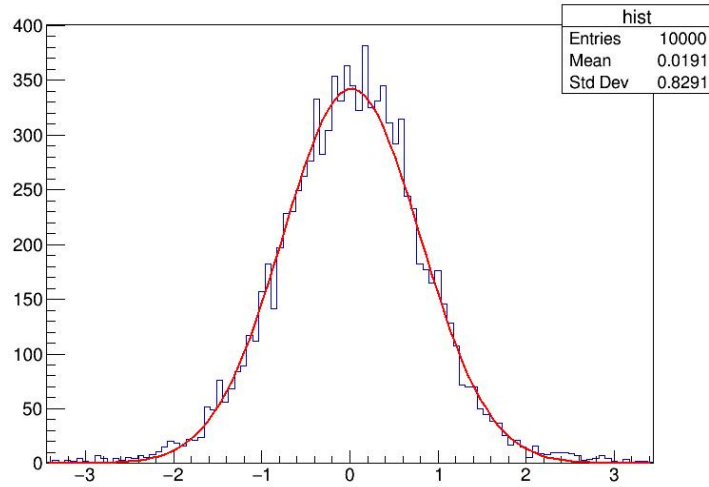
(120MeV,20°)



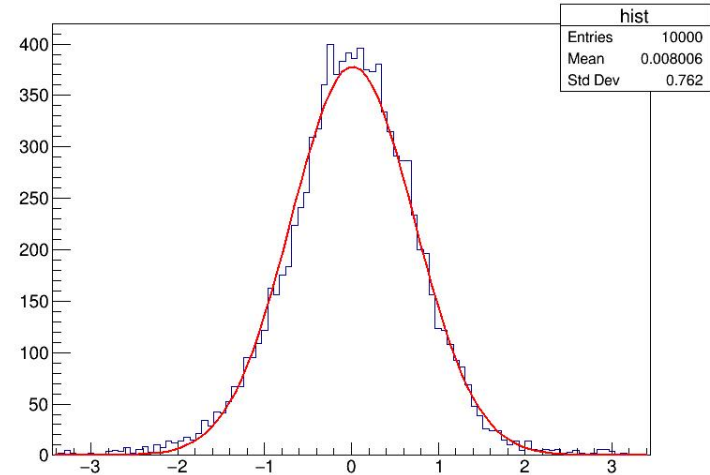
Backup

with beam-BG (Pair :250515)

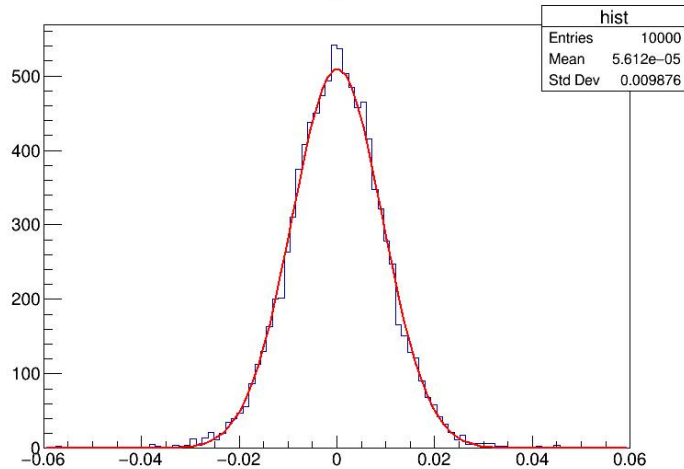
(150MeV,20°) z_0



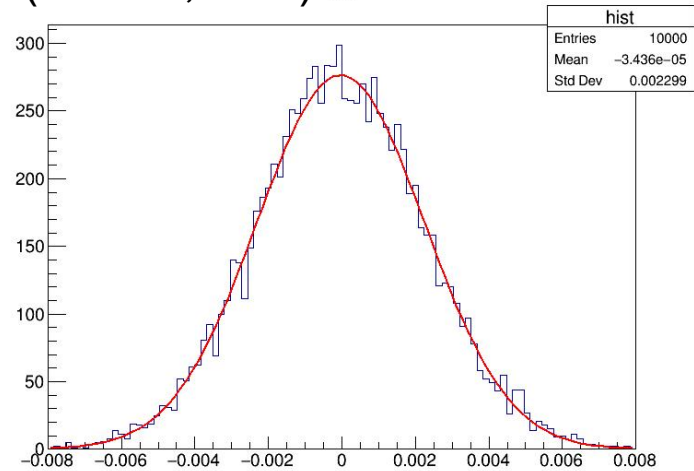
(170MeV,20°) z_0



(20GeV,20°) z_0

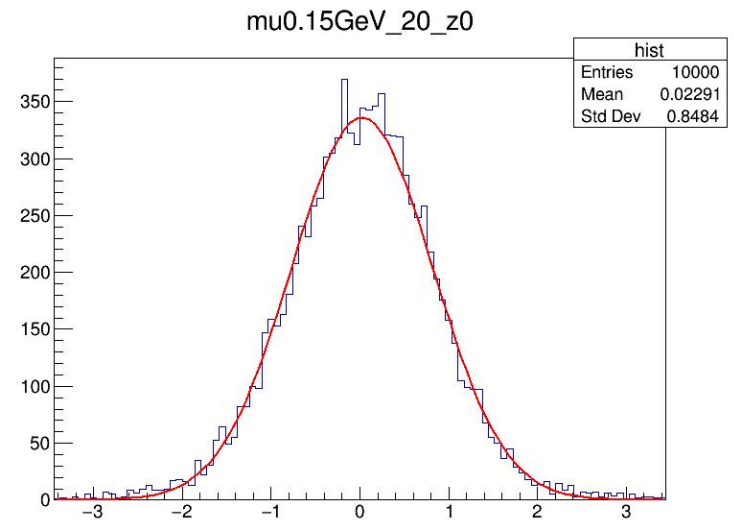
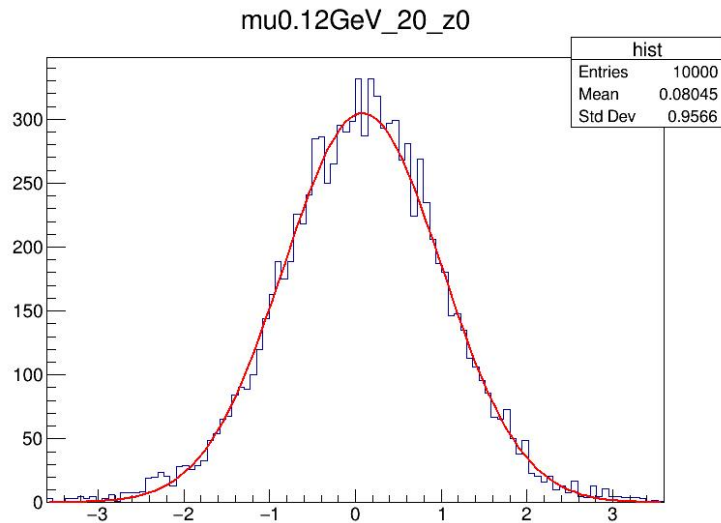
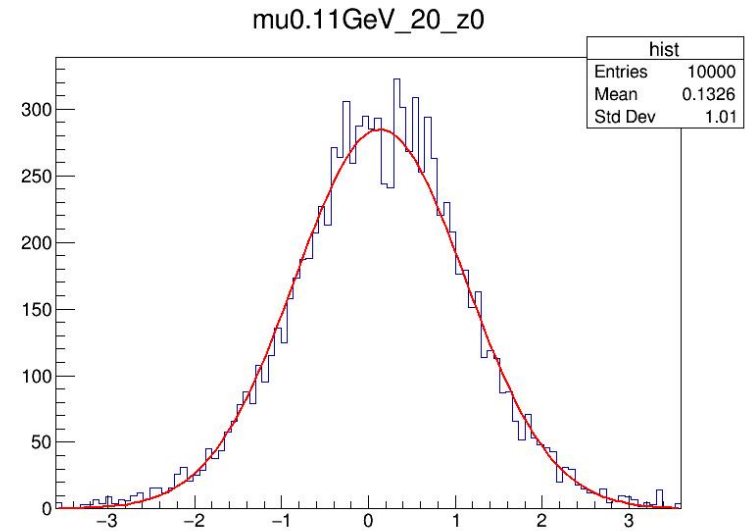
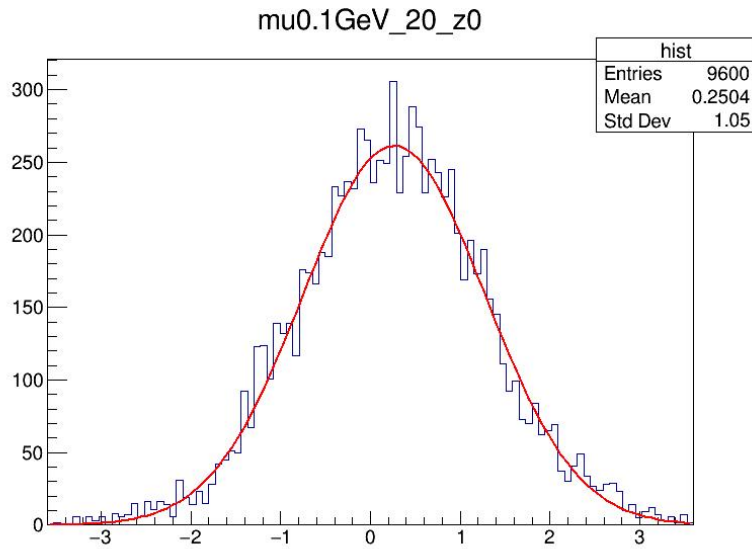


(50GeV,85°) d_0



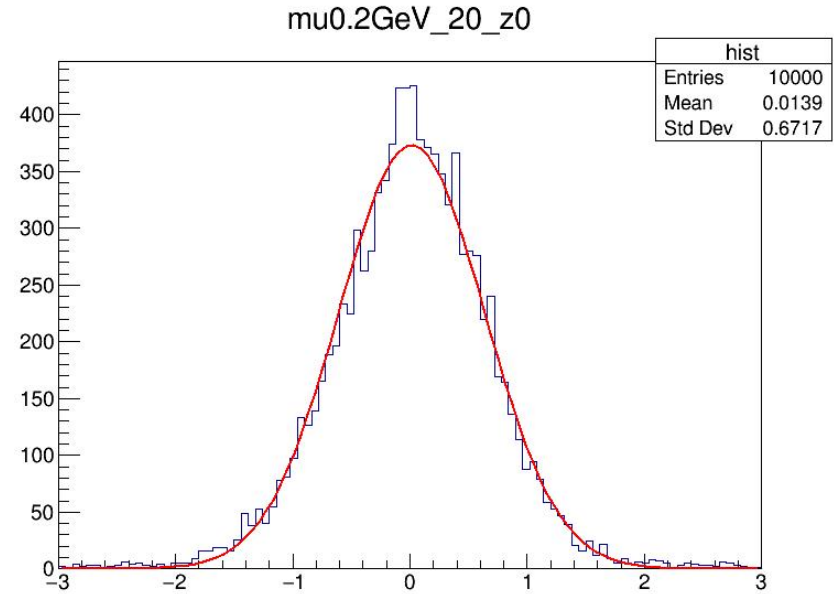
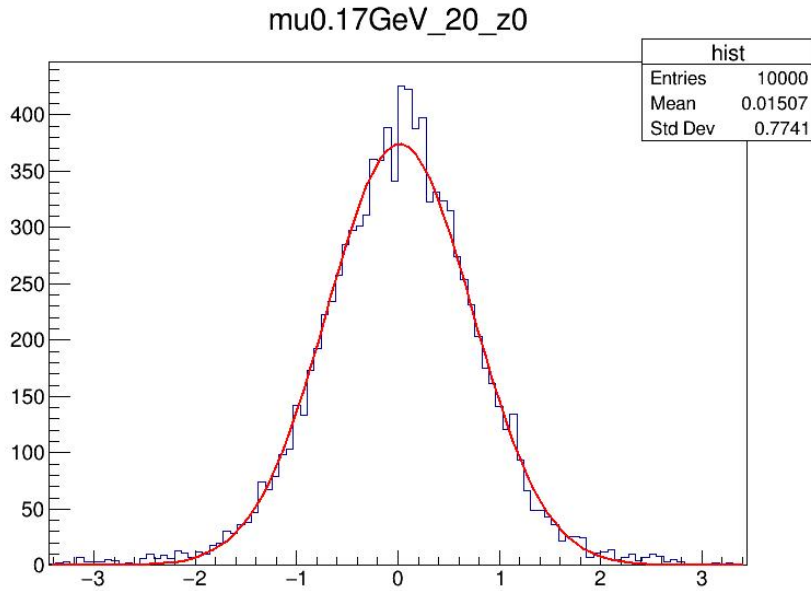
Backup

- with beam-BG (Pair:250823)



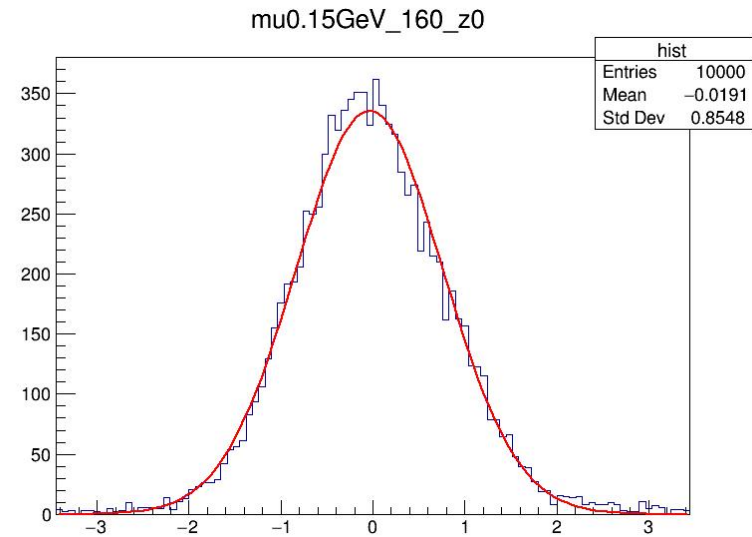
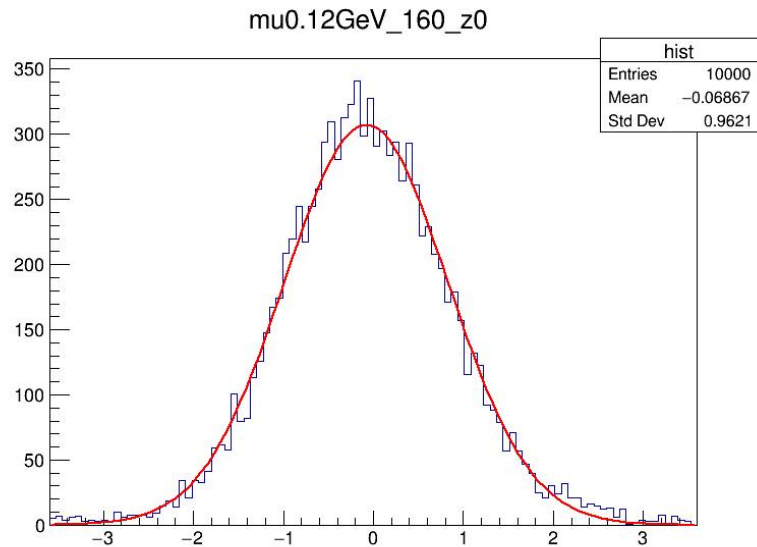
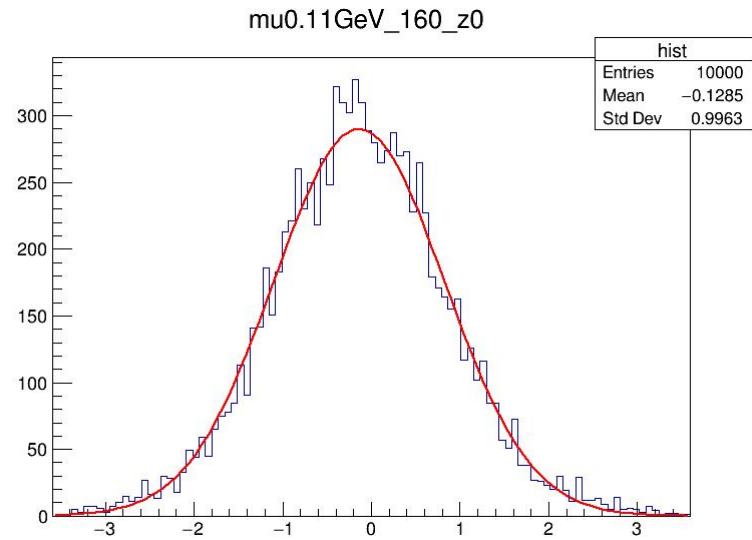
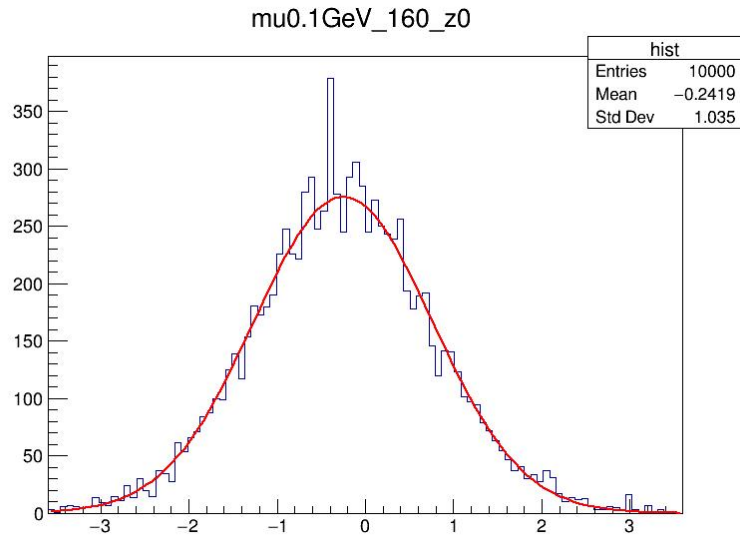
Backup

- with beam-BG (Pair :250823)



Backup

- with beam-BG (Pair:250823)



Backup

- with beam-BG (Pair :250823)

