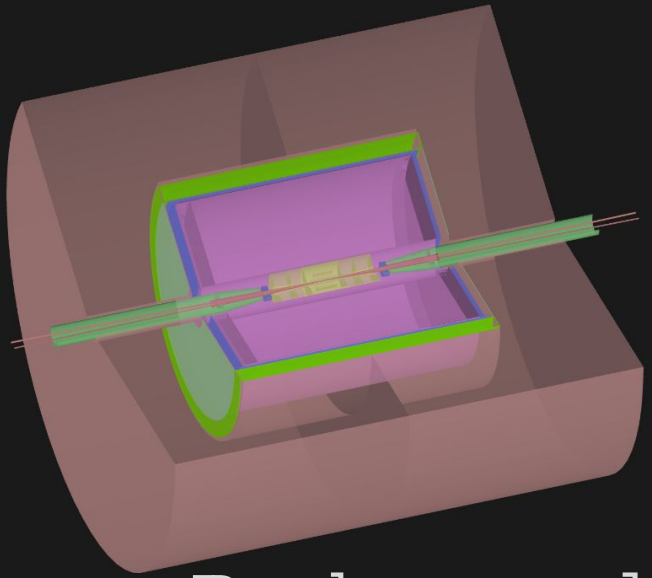
FCC-ee IDEA detector concept

FCC IDEA



Beam Background

Drift Chamber

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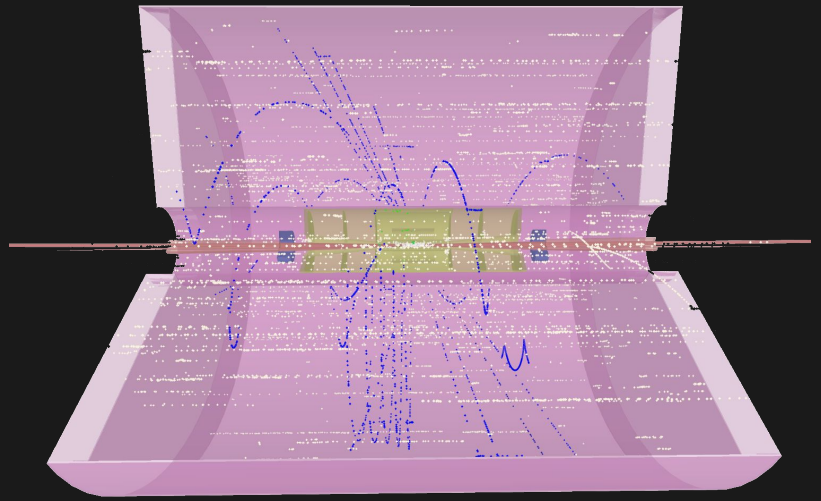
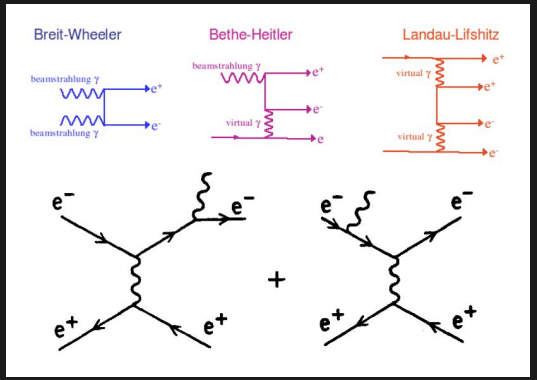
Beam Background... Background

- Beam Induced Background on the IDEA Detector (Wire Drift Chamber)
- Focused on luminosity background signals caused by two counter-rotating beams
    - Lead by Incoherent Pair Production (Guinea Pig Simulation)

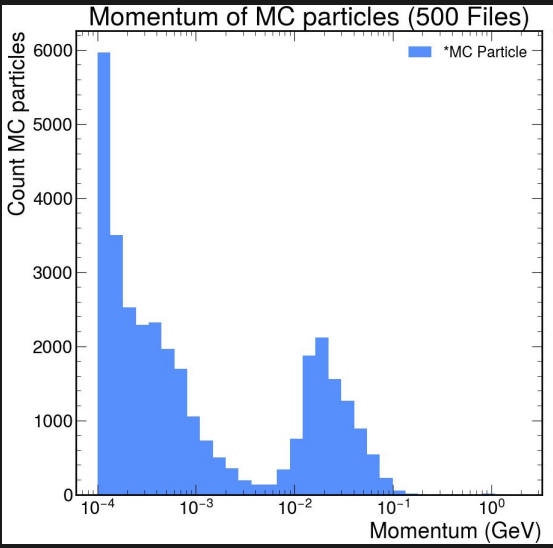


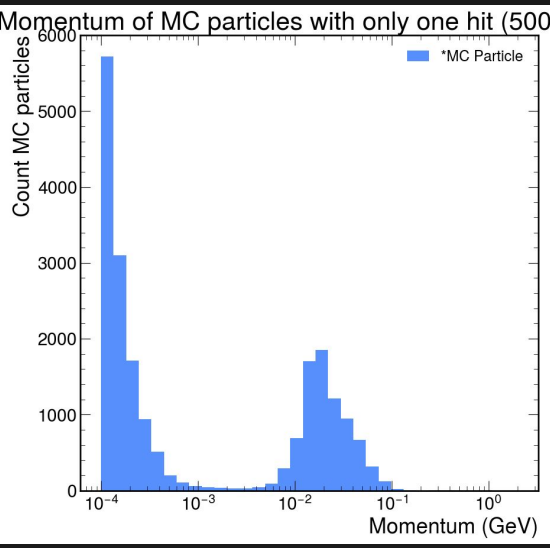
Goal:

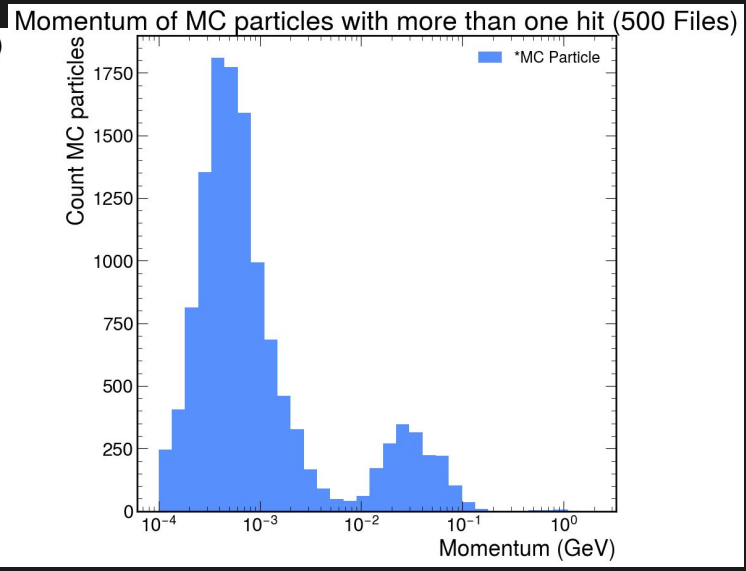
- Characterize the background hits
- Separate background from signal hits in the tracks

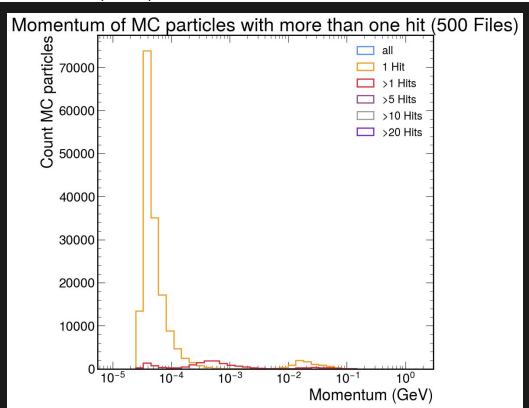


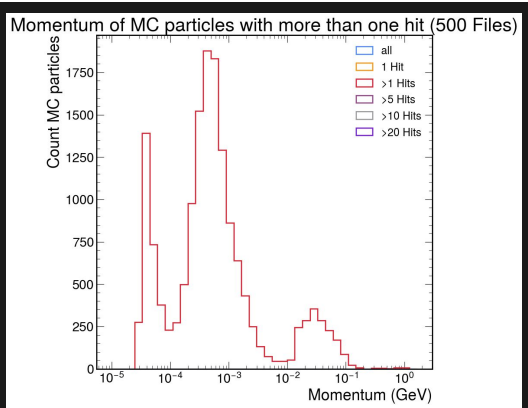
Momentum of MC Particles (500 Background Files)



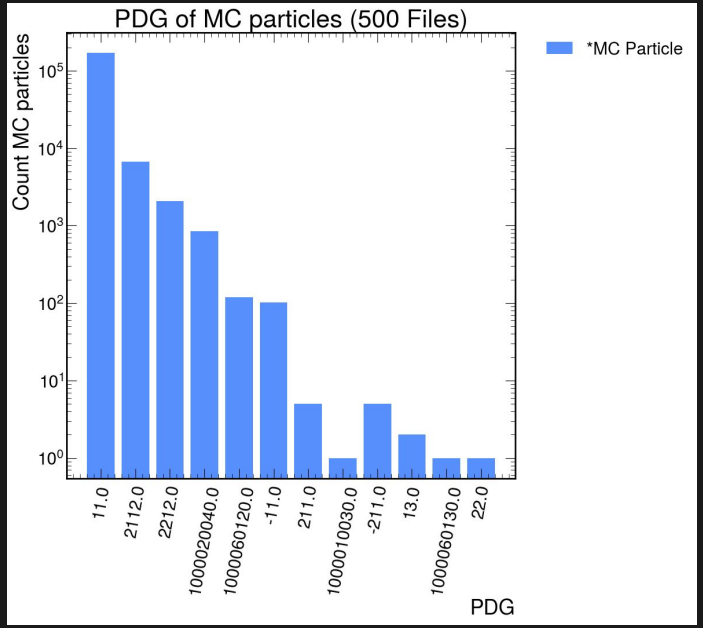


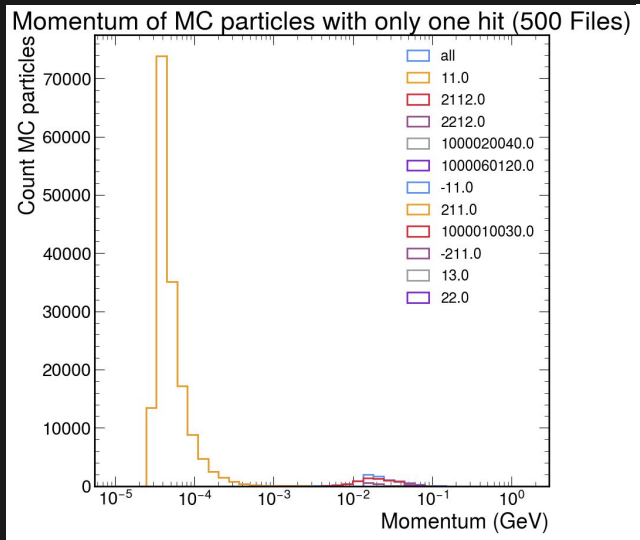


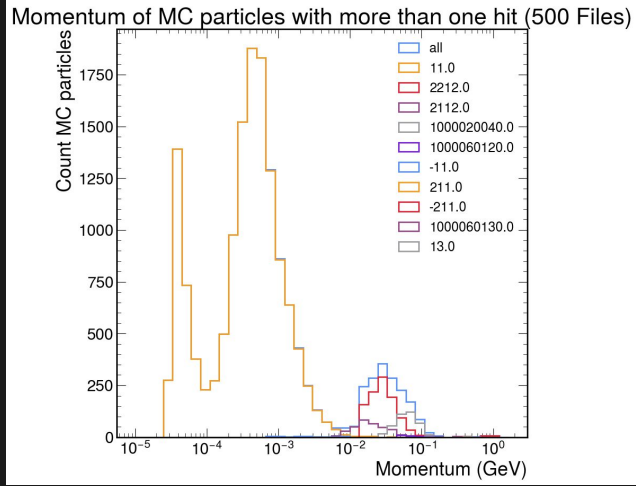




MC Particles separated into PDG (500 Background Files)







QUARKS

d	1
u	2
s	3
c	4
b	5
t	6
b'	7
t'	8

LEPTONS

e^-	11
ν_e	12
μ^-	13
ν_μ	14
τ^-	15
ν_τ	16
τ'^-	17
$\nu_{\tau'}$	18

EXCITED PARTICLES

d^*	4000001
u^*	4000002
e^*	4000011
ν_e^*	4000012

GAUGE AND HIGGS BOSONS

g	(9) 21
γ	22
Z^0	23
W^+	24
h^0/H_1^0	25
Z'/Z_2^0	32
Z''/Z_3^0	33
W'/W_2^+	34
H^0/H_2^0	35
A^0/H_3^0	36
H^+	37

LIGHT BARYONS

p	2212
n	2112
Δ^{++}	2224
Δ^+	2214
Δ^0	2114
Δ^-	1114

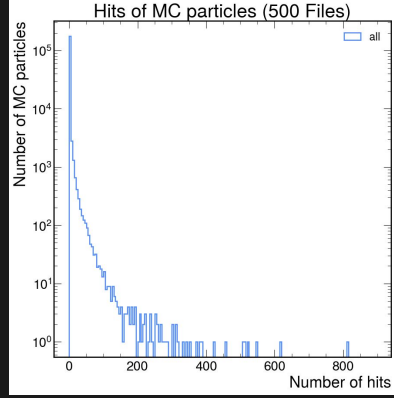
DIQUARKS

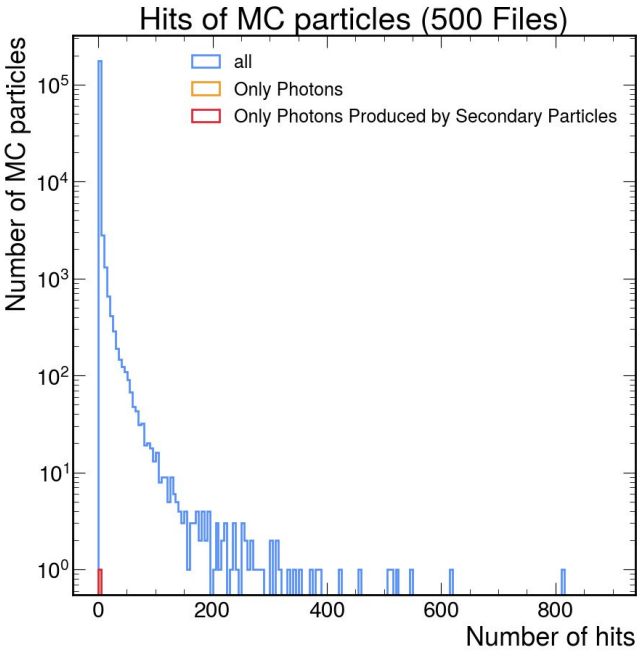
$(dd)_1$	1103
$(ud)_0$	2101
$(ud)_1$	2103
$(uu)_1$	2203
$(sd)_0$	3101
$(sd)_1$	3103
$(su)_0$	3201
$(su)_1$	3203
$(ss)_1$	3303
$(cd)_0$	4101
$(cd)_1$	4103
$(cu)_0$	4201
$(cu)_1$	4203
$(cs)_0$	4301
$(cs)_1$	4303
$(cc)_1$	4403
$(bd)_0$	5101
$(bd)_1$	5103
$(bu)_0$	5201
$(bu)_1$	5203
$(bs)_0$	5301
$(bs)_1$	5303
$(bc)_0$	5401
$(bc)_1$	5403
$(bb)_1$	5503

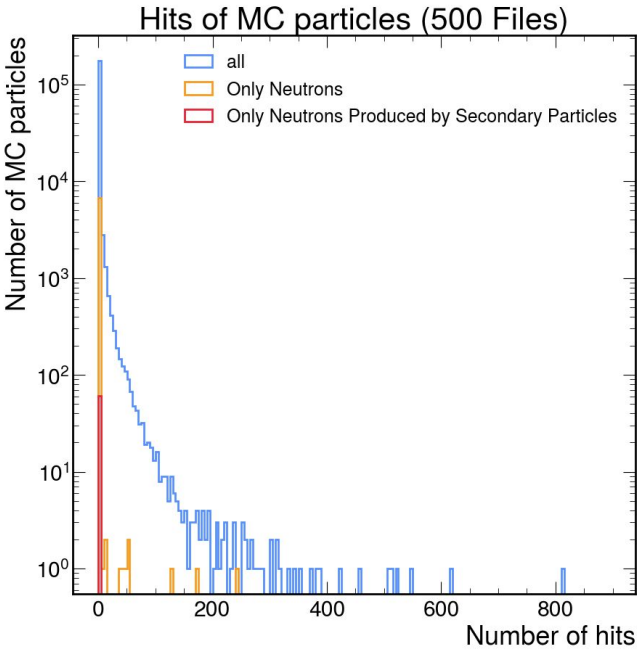
TECHNICOLOR PARTICLES

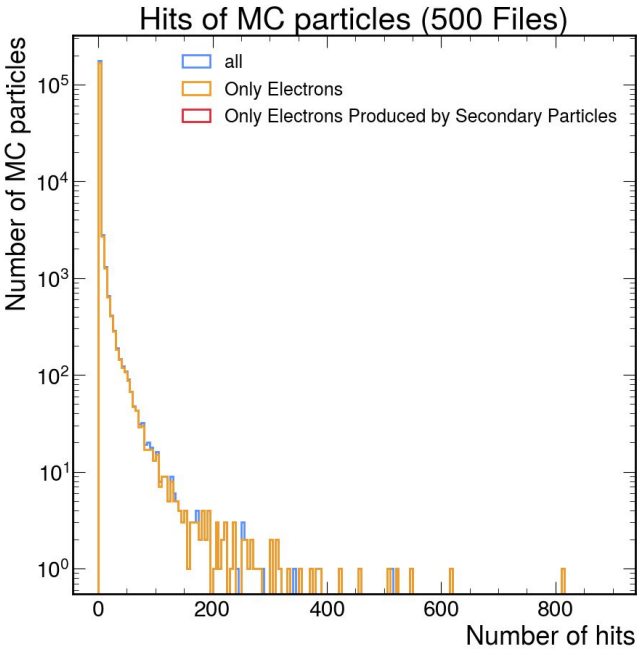
π^0_{tech}	3000111
π^+_{tech}	3000211
π'^0_{tech}	3000221
η^0_{tech}	3100221
ρ^0_{tech}	3000113
ρ^+_{tech}	3000213
ω^0_{tech}	3000223
V_8	3100021
$\pi^1_{\text{tech},22}$	3060111
$\pi^8_{\text{tech},22}$	3160111
$\rho_{\text{tech},11}$	3130113
$\rho_{\text{tech},12}$	3140113
$\rho_{\text{tech},21}$	3150113
$\rho_{\text{tech},22}$	3160113

Hits of MC Particles (500 Background Files)

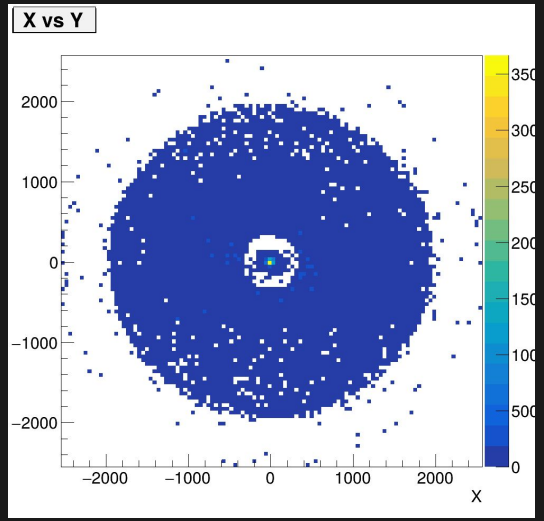


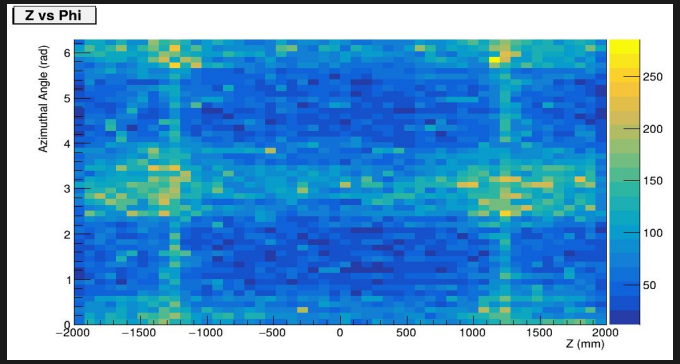


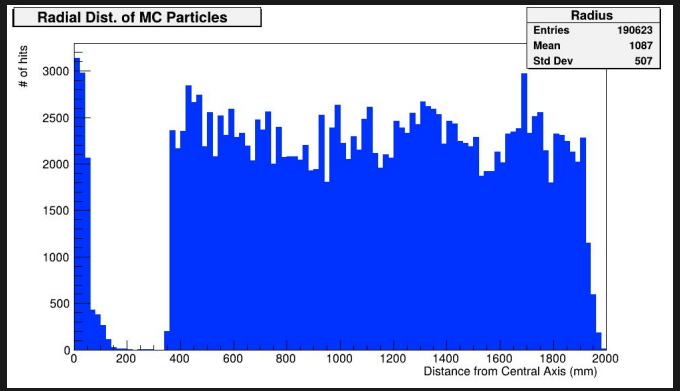


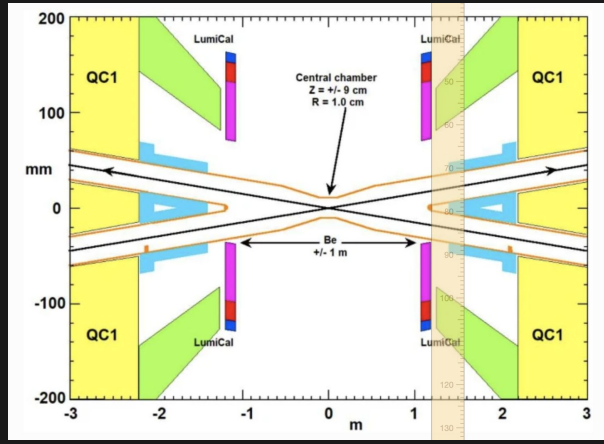


MC Particles Position (X vs Y, Z vs Phi, Radial)









Future

What's Next:

- Continue to determine key characteristics of the background
    - Particularly investigate occupancy
- Explore differences to signal
- If time, preform cuts to remove background from overlaid signal