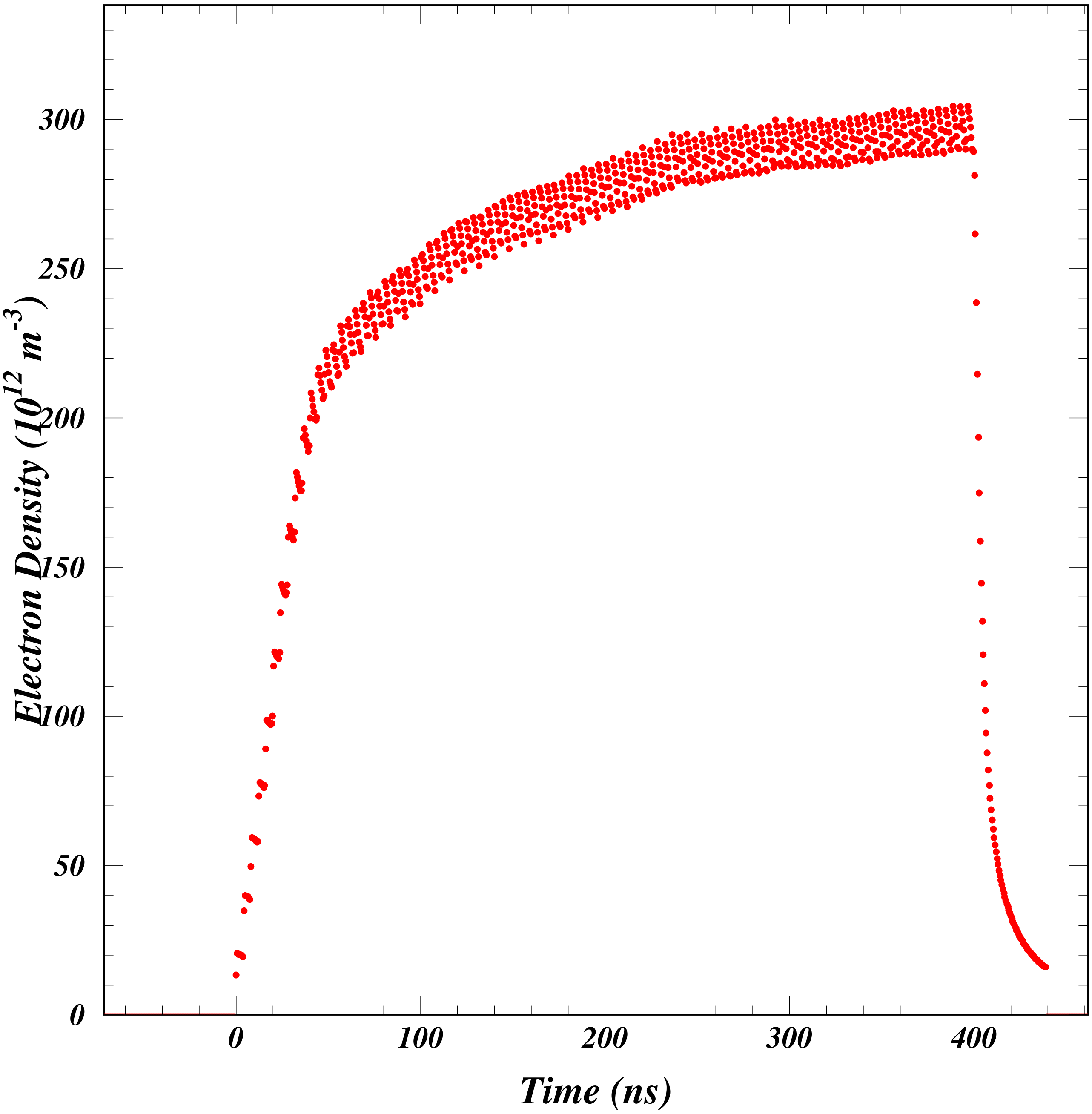
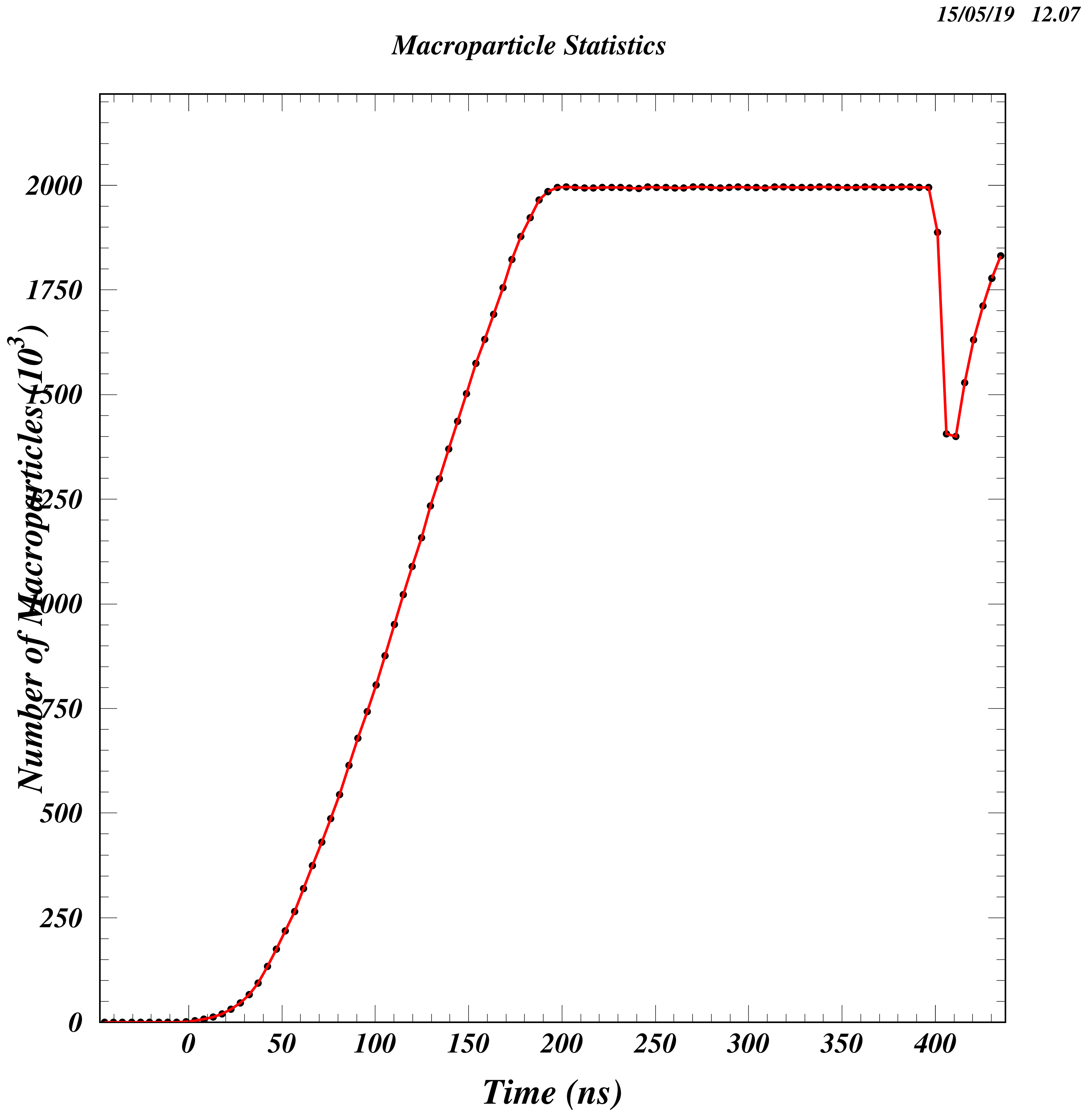
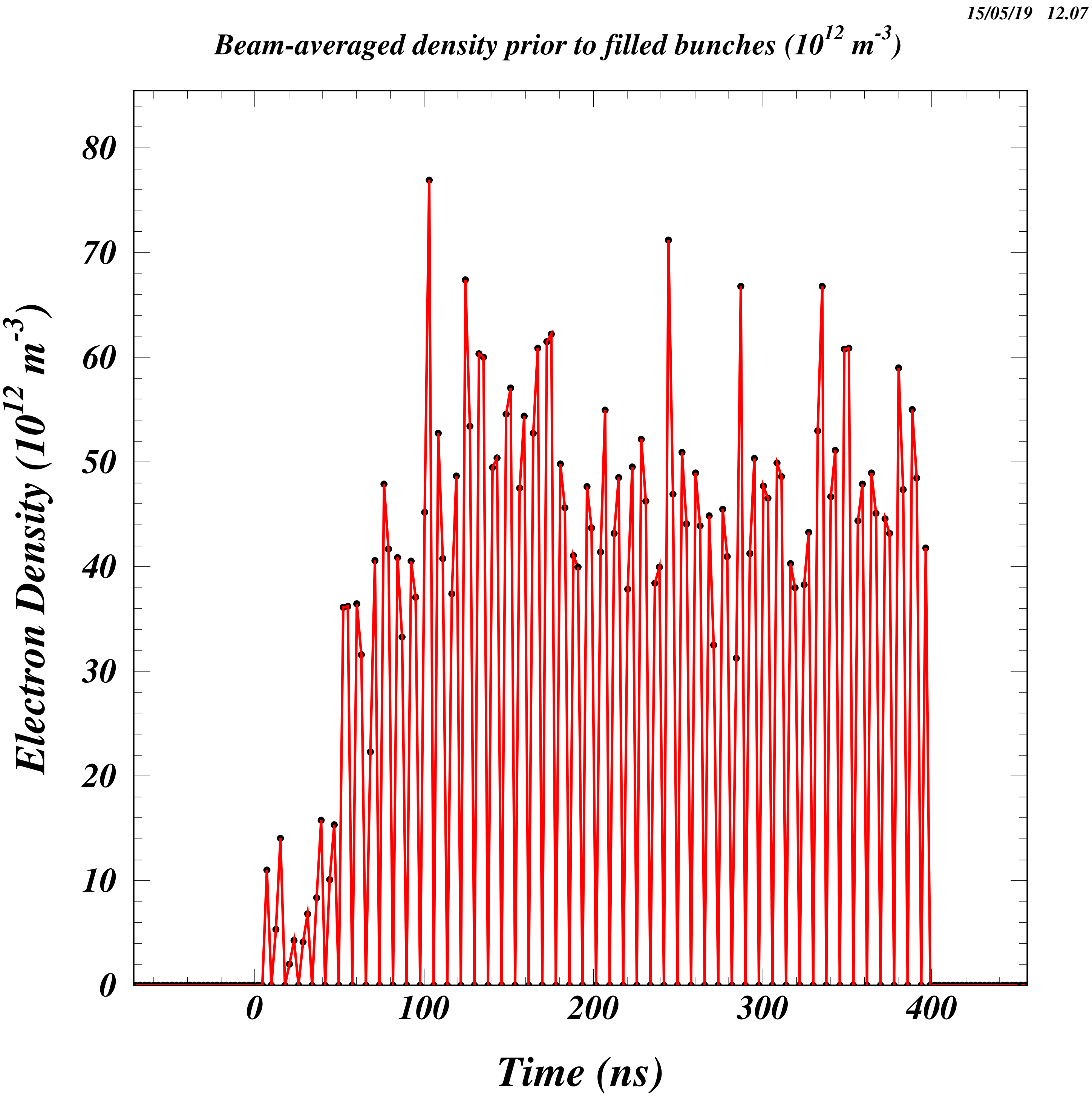
15/05/19 12.07

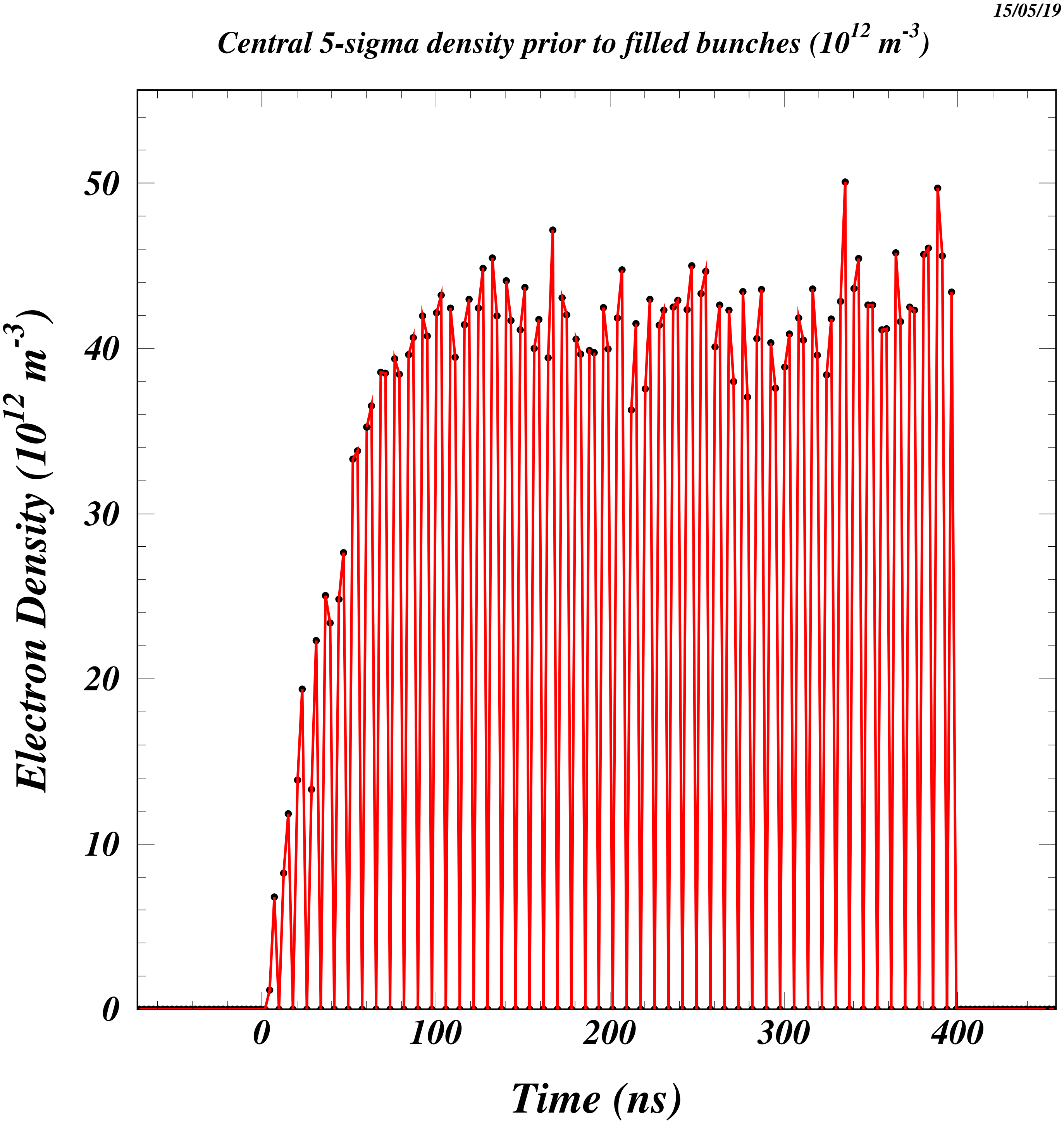
Job 39901: ECLOUD plots



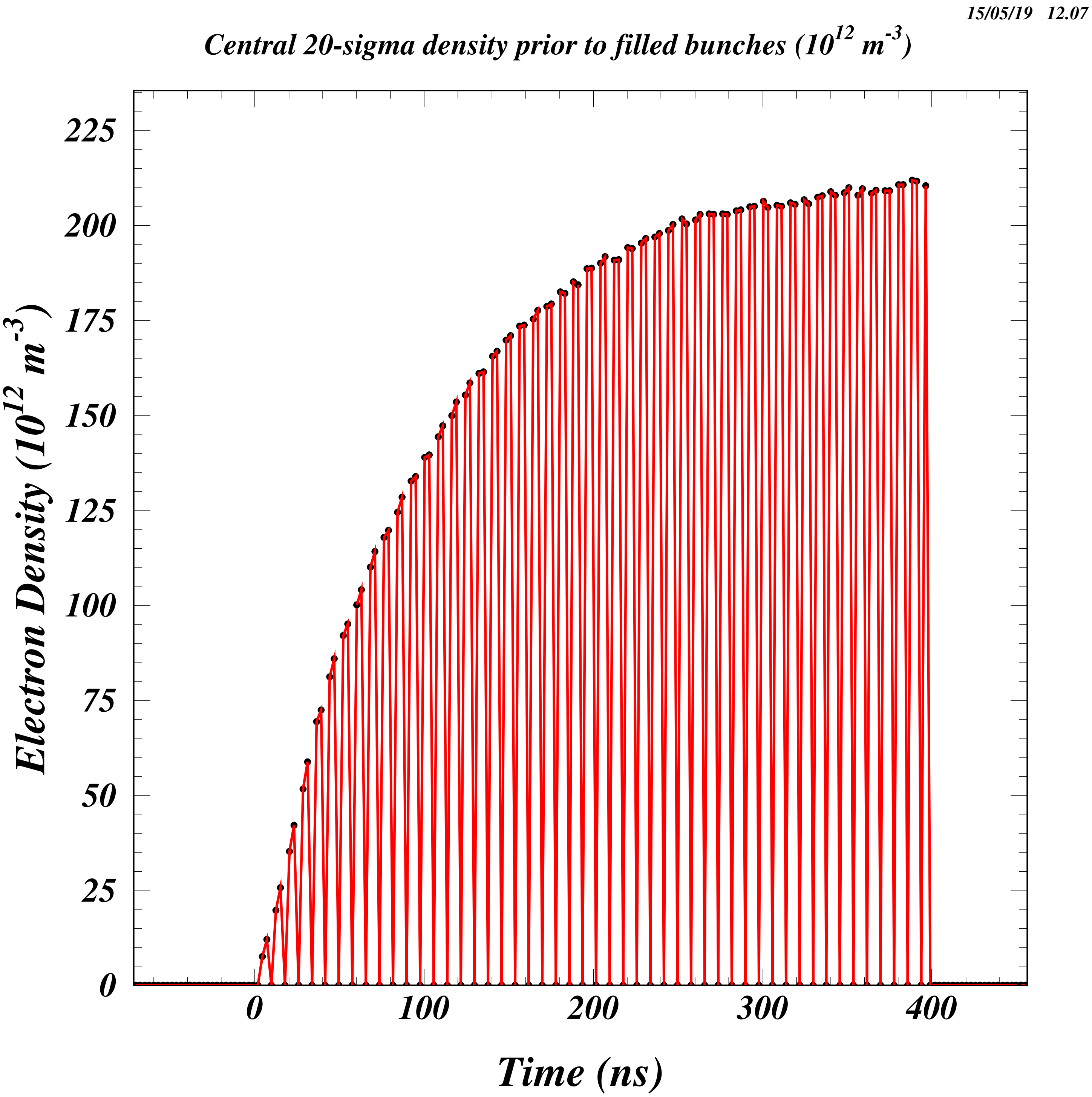

15/05/19 12.07
Macroparticle Statistics
Number of Macroparticles (10^3)
0
250
500
750
1000
1250
1500
1750
2000
0
50
100
150
200
250
300
350
400
Time (ns)

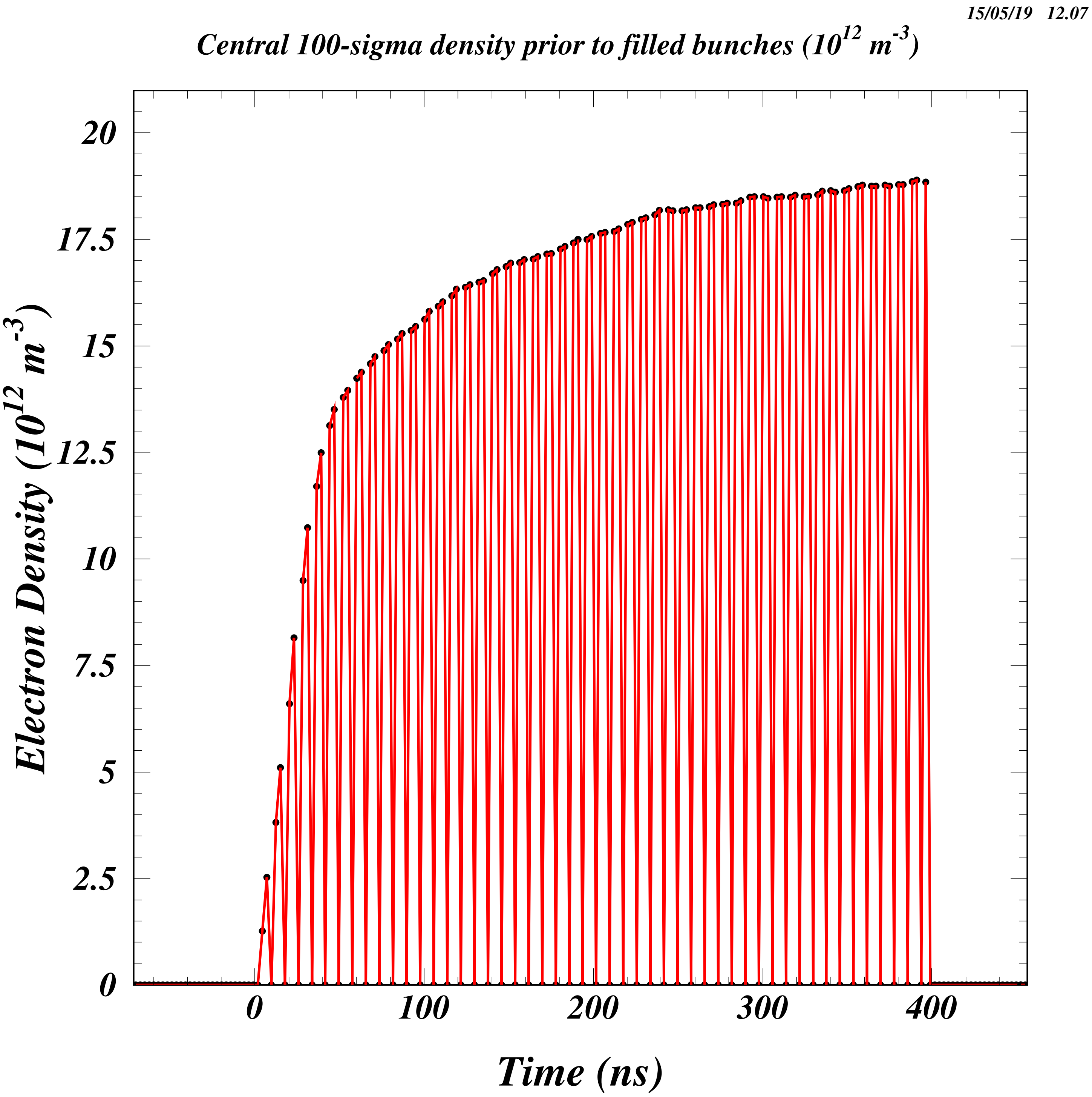


15/05/19 12.07
Beam-averaged density prior to filled bunches (10^{12} m^{-3})
Electron Density (10^{12} m^{-3})
0
10
20
30
40
50
60
70
80
0
100
200
300
400
Time (ns)

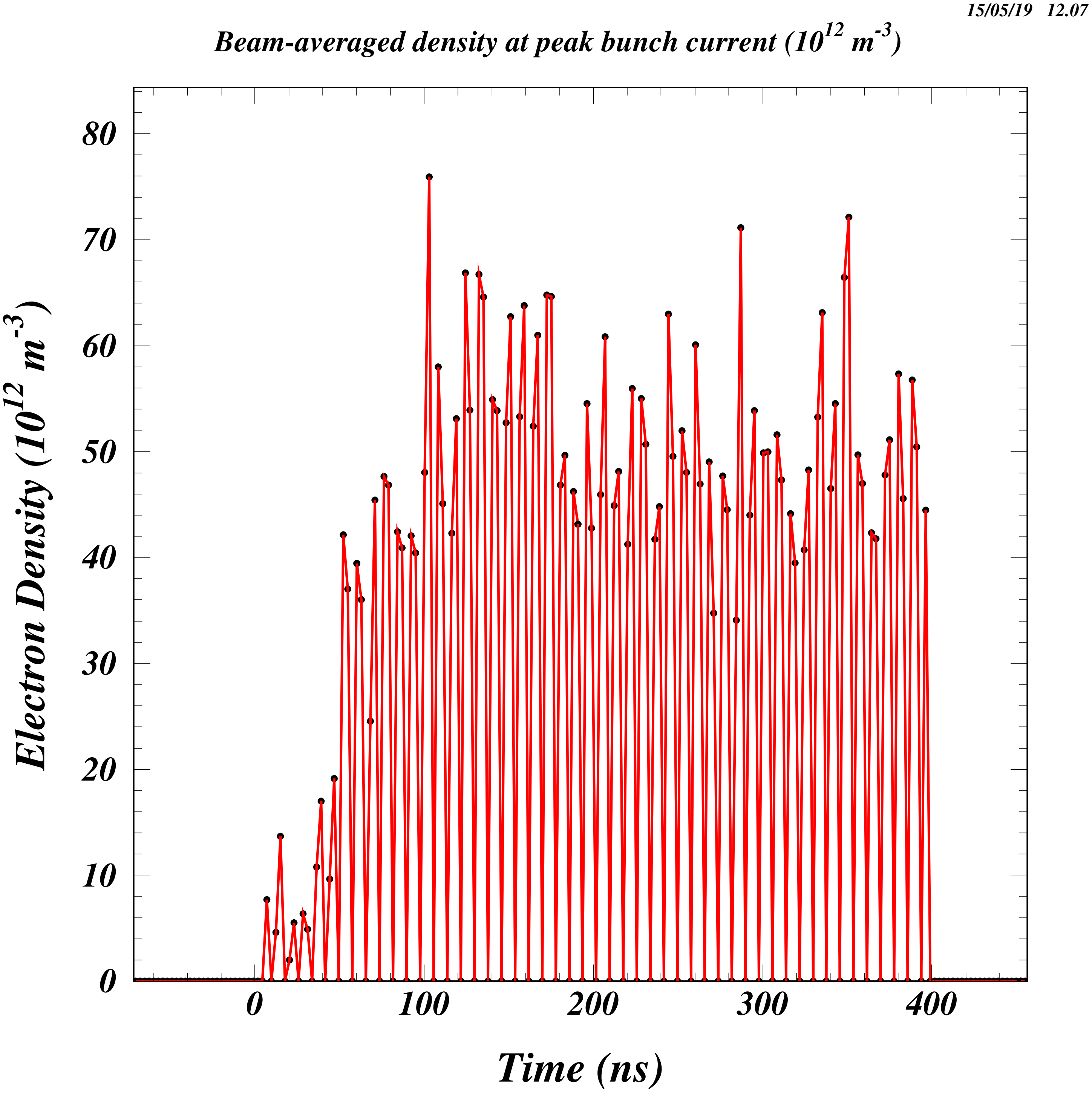


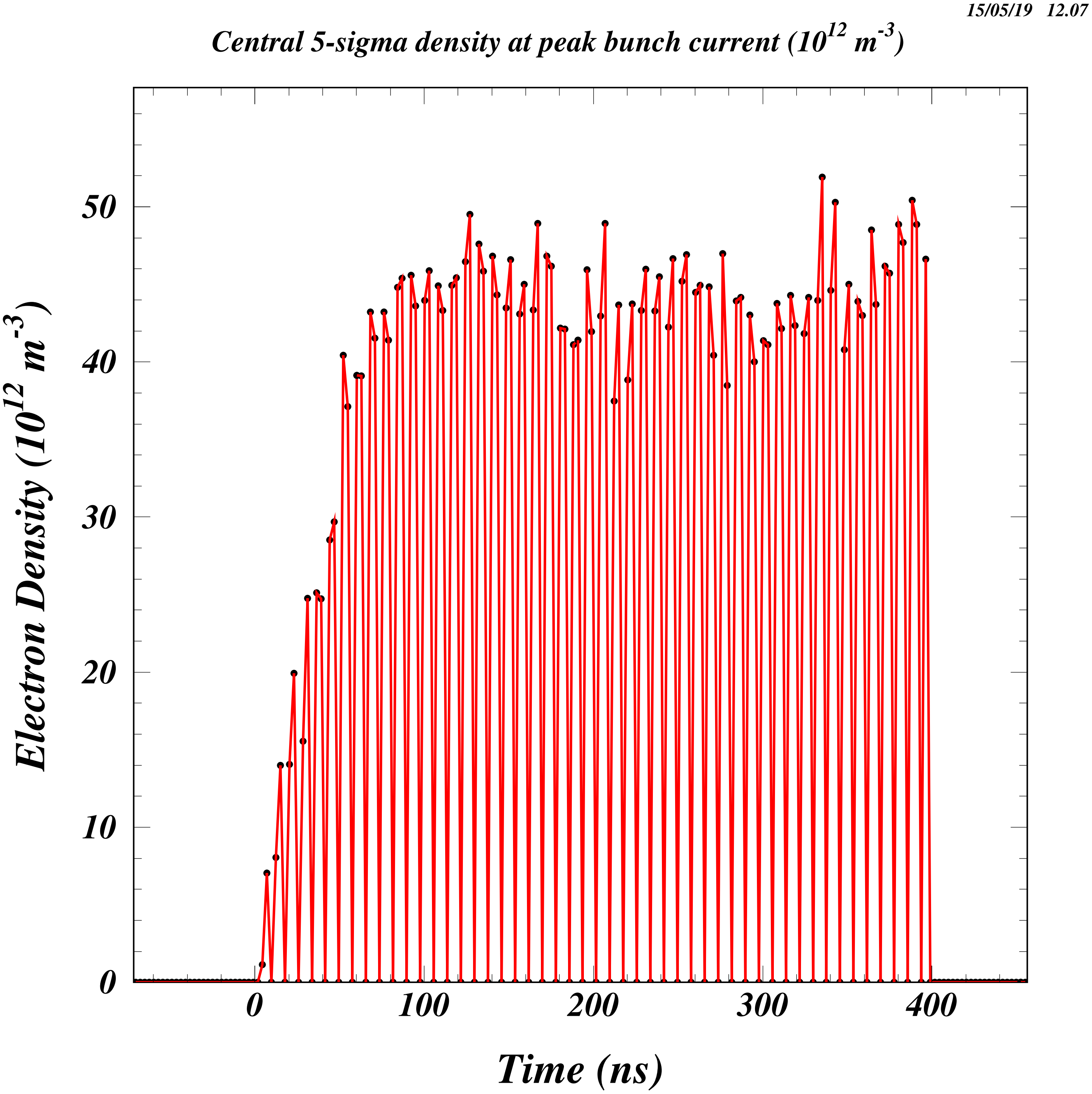
Central 5-sigma density prior to filled bunches (10^{12} m^{-3})
Electron Density (10^{12} m^{-3})
Time (ns)
0
10
20
30
40
50
0
100
200
300
400

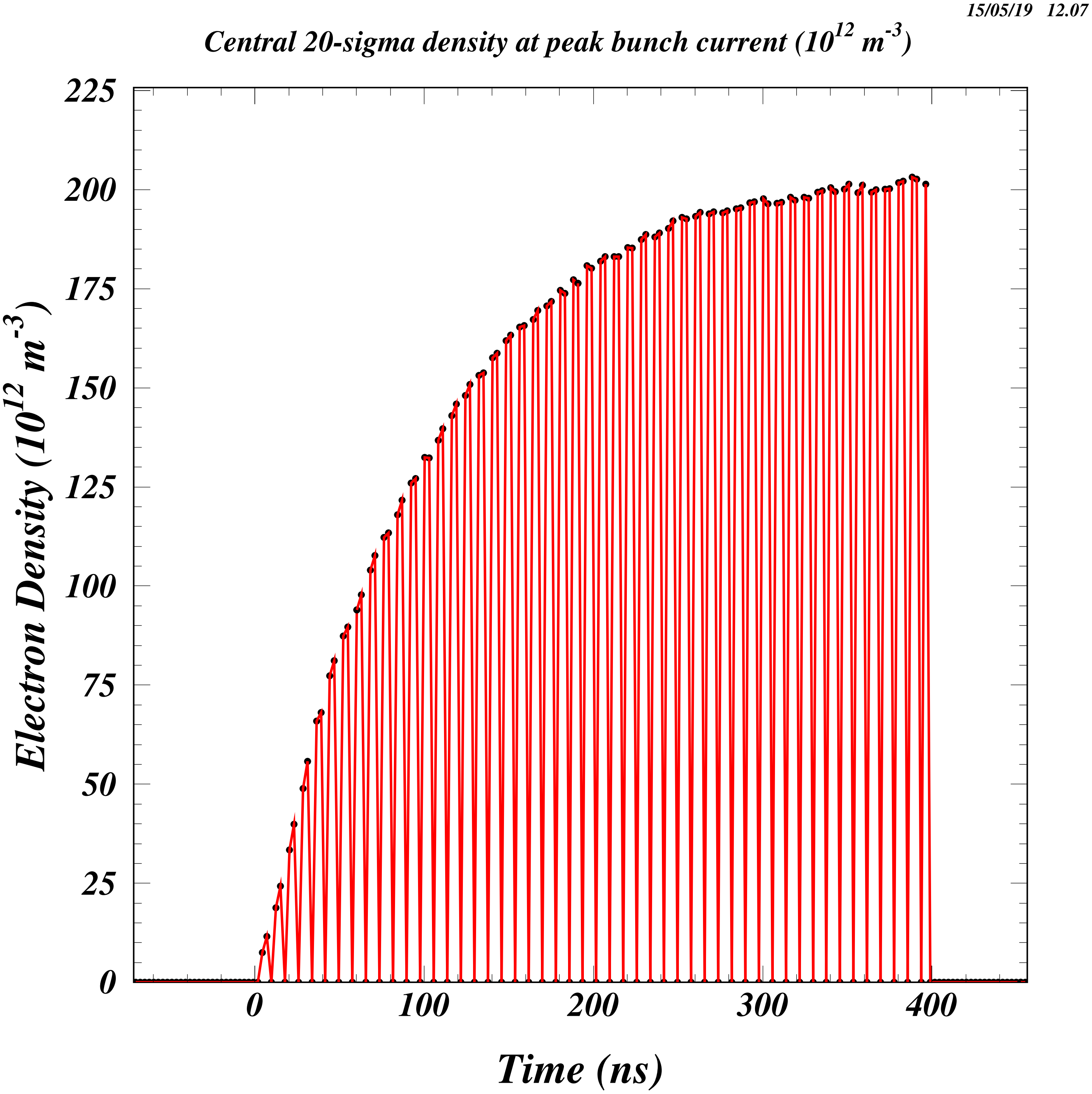

15/05/19 12.07
Central 20-sigma density prior to filled bunches (10^{12} m^{-3})
Electron Density (10^{12} m^{-3})
225
200
175
150
125
100
75
50
25
0
0
100
200
300
400
Time (ns)



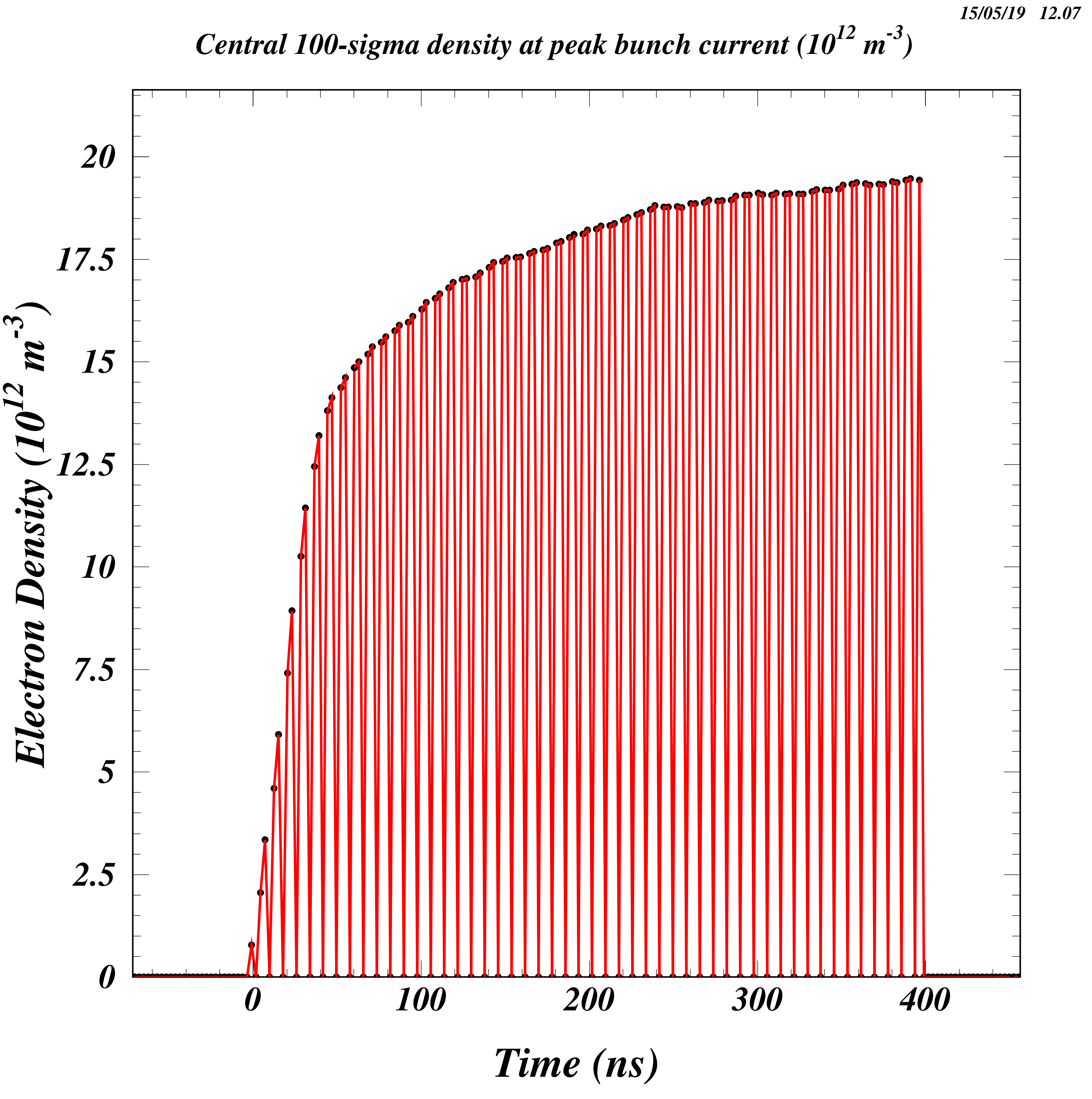
15/05/19 12.07
Central 100-sigma density prior to filled bunches (10^{12} m^{-3})
Electron Density (10^{12} m^{-3})
Time (ns)
0
2.5
5
7.5
10
12.5
15
17.5
20
0
100
200
300
400

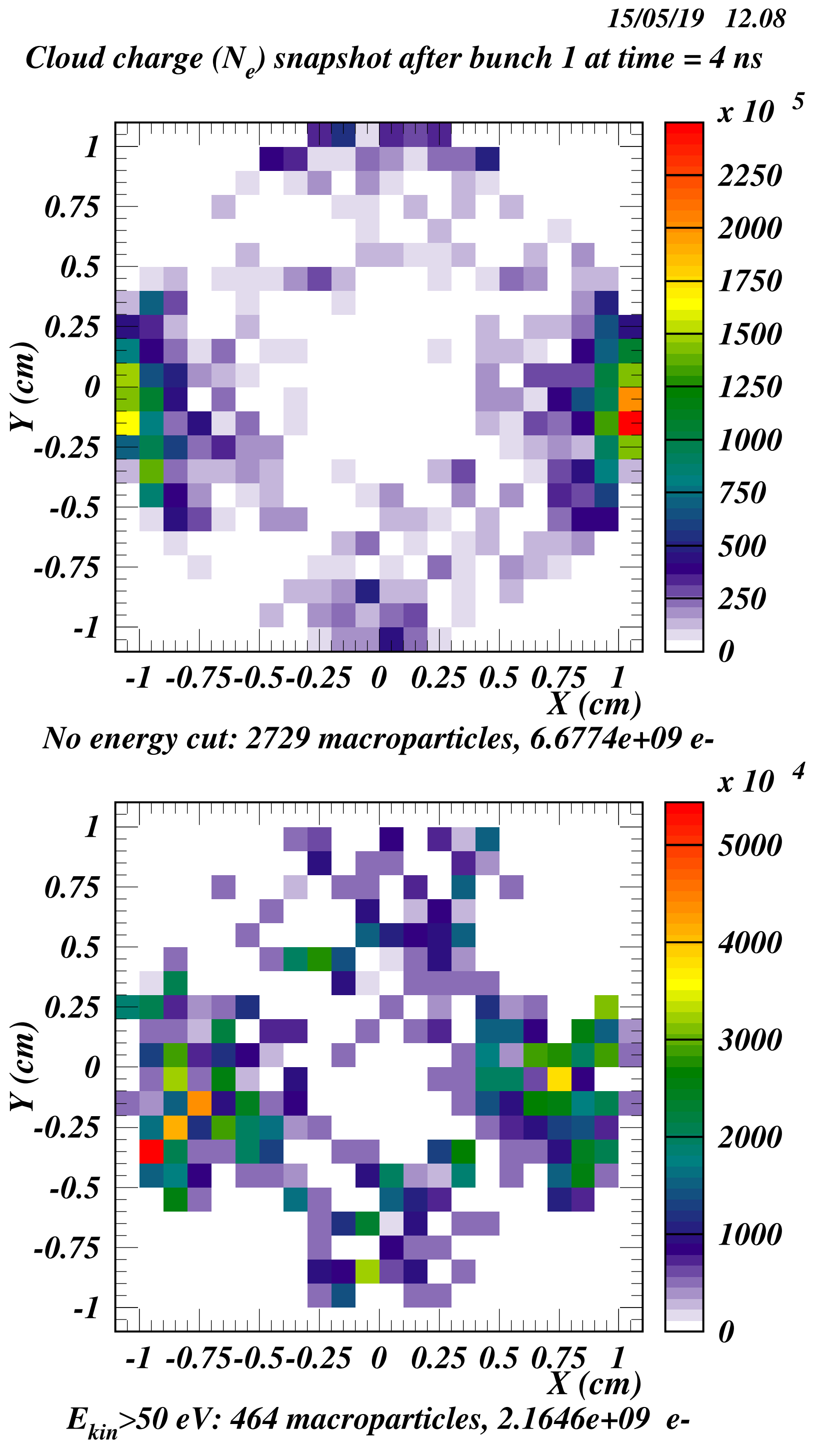

15/05/19 12.07
Beam-averaged density at peak bunch current (10^{12} m^{-3})
Electron Density (10^{12} m^{-3})
0
10
20
30
40
50
60
70
80
0
100
200
300
400
Time (ns)

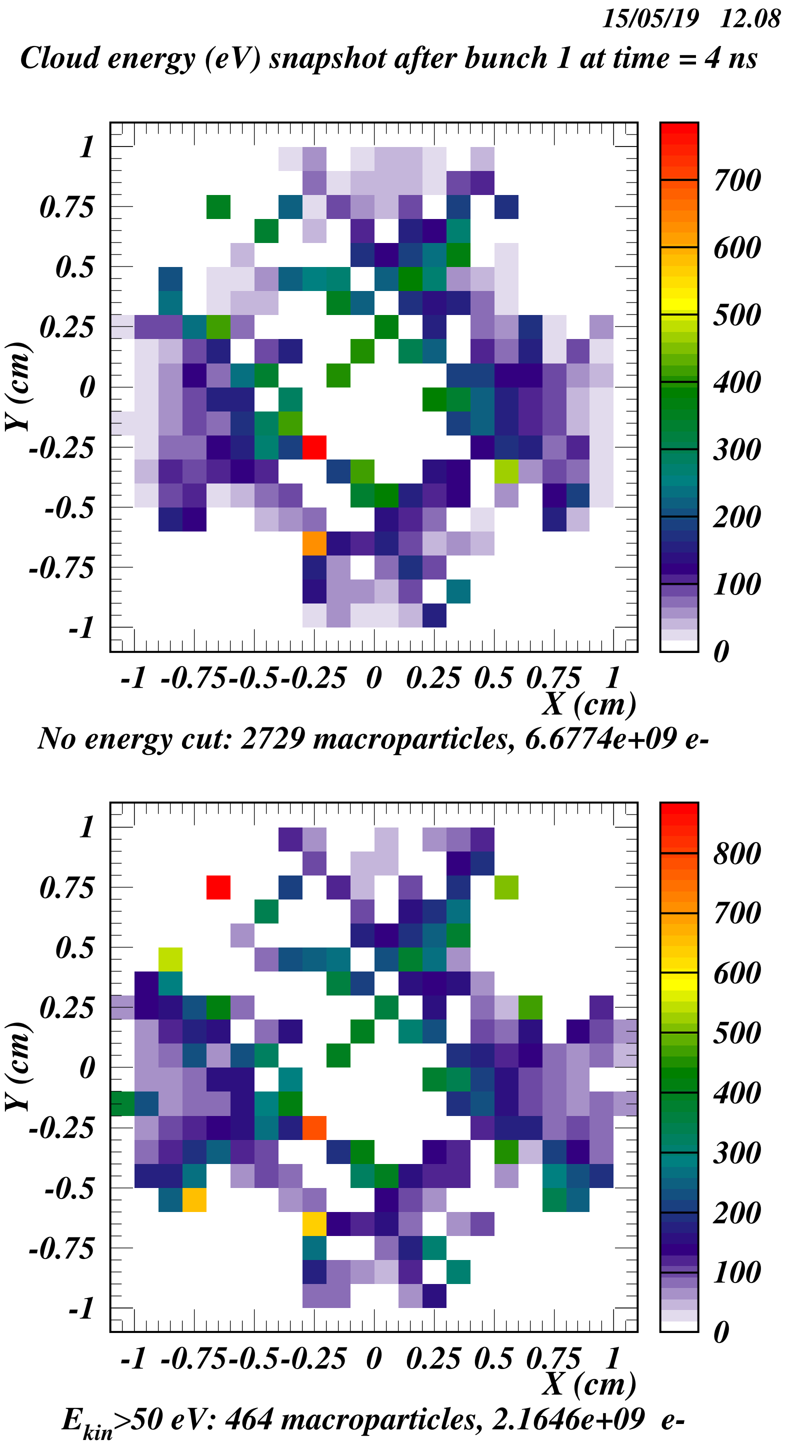

15/05/19 12.07
Central 5-sigma density at peak bunch current (10^{12} m^{-3})
Electron Density (10^{12} m^{-3})
0
10
20
30
40
50
0
100
200
300
400
Time (ns)

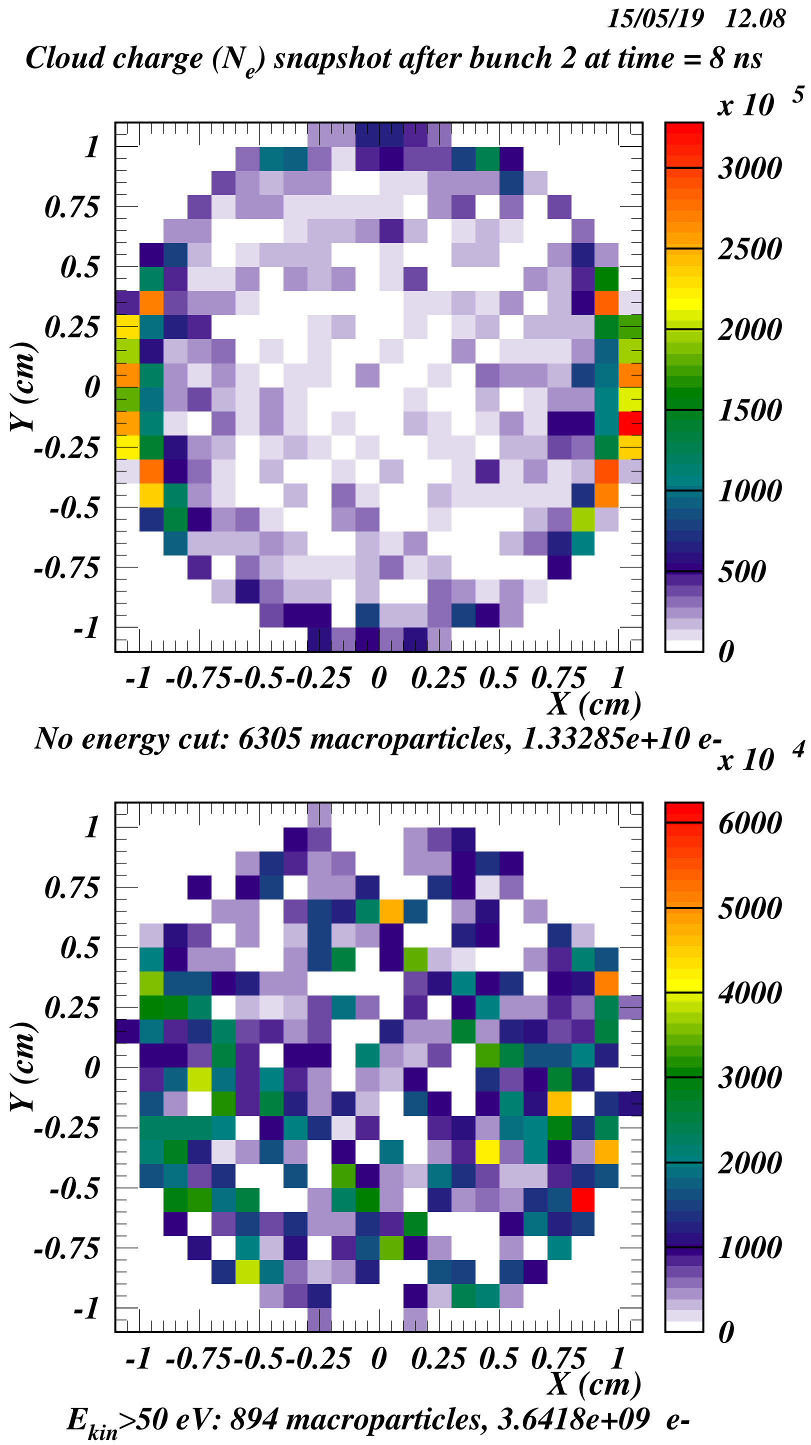


15/05/19 12.07
Central 20-sigma density at peak bunch current (10^{12} m^{-3})
Electron Density (10^{12} m^{-3})
225
200
175
150
125
100
75
50
25
0
0
100
200
300
400
Time (ns)


15/05/19 12.07
Central 100-sigma density at peak bunch current (10^{12} m^{-3})
Electron Density (10^{12} m^{-3})
0
2.5
5
7.5
10
12.5
15
17.5
20
0
100
200
300
400
Time (ns)

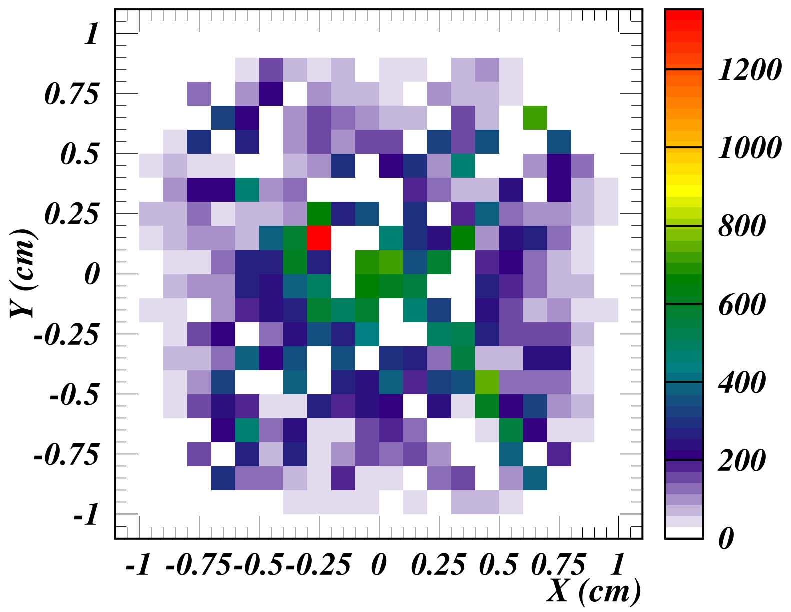

15/05/19 12.08
Cloud charge (N_e) snapshot after bunch 1 at time = 4 ns
x 10 5
2250
2000
1750
1500
1250
1000
750
500
250
0
Y (cm)
X (cm)
No energy cut: 2729 macroparticles, 6.6774e+09 e-
x 10 4
5000
4000
3000
2000
1000
0
Y (cm)
X (cm)
E_{kin}>50 eV: 464 macroparticles, 2.1646e+09 e-


15/05/19 12.08
Cloud energy (eV) snapshot after bunch 1 at time = 4 ns
Y (cm)
X (cm)
1
0.75
0.5
0.25
0
-0.25
-0.5
-0.75
-1
700
600
500
400
300
200
100
0
No energy cut: 2729 macroparticles, 6.6774e+09 e-
800
E_kin>50 eV: 464 macroparticles, 2.1646e+09 e-

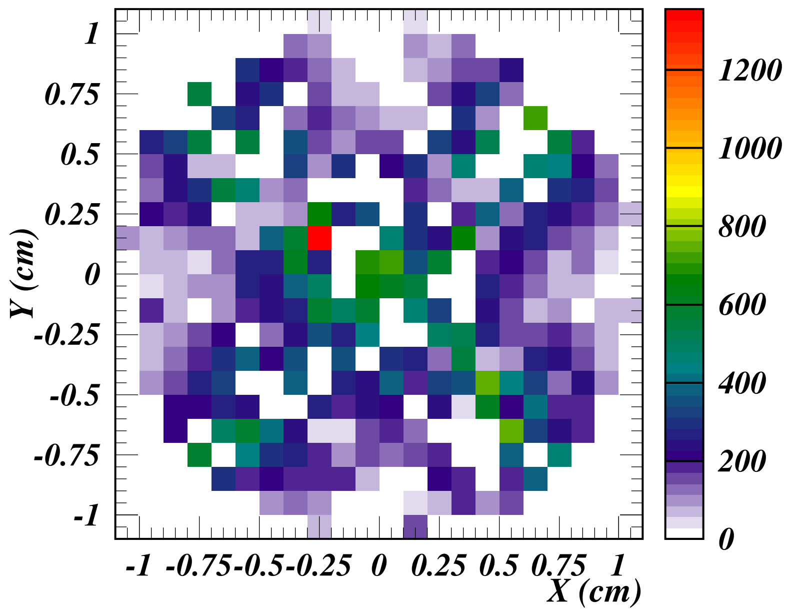

15/05/19 12.08
Cloud charge (N_e) snapshot after bunch 2 at time = 8 ns
x 10 5
3000
2500
2000
1500
1000
500
0
Y (cm)
1
0.75
0.5
0.25
0
-0.25
-0.5
-0.75
-1
-1 -0.75-0.5-0.25 0 0.25 0.5 0.75 1
X (cm)
No energy cut: 6305 macroparticles, 1.33285e+10 e-
x 10 4
6000
5000
4000
3000
2000
1000
0
Y (cm)
X (cm)
E_{kin}>50 eV: 894 macroparticles, 3.6418e+09 e-

15/05/19   12.08

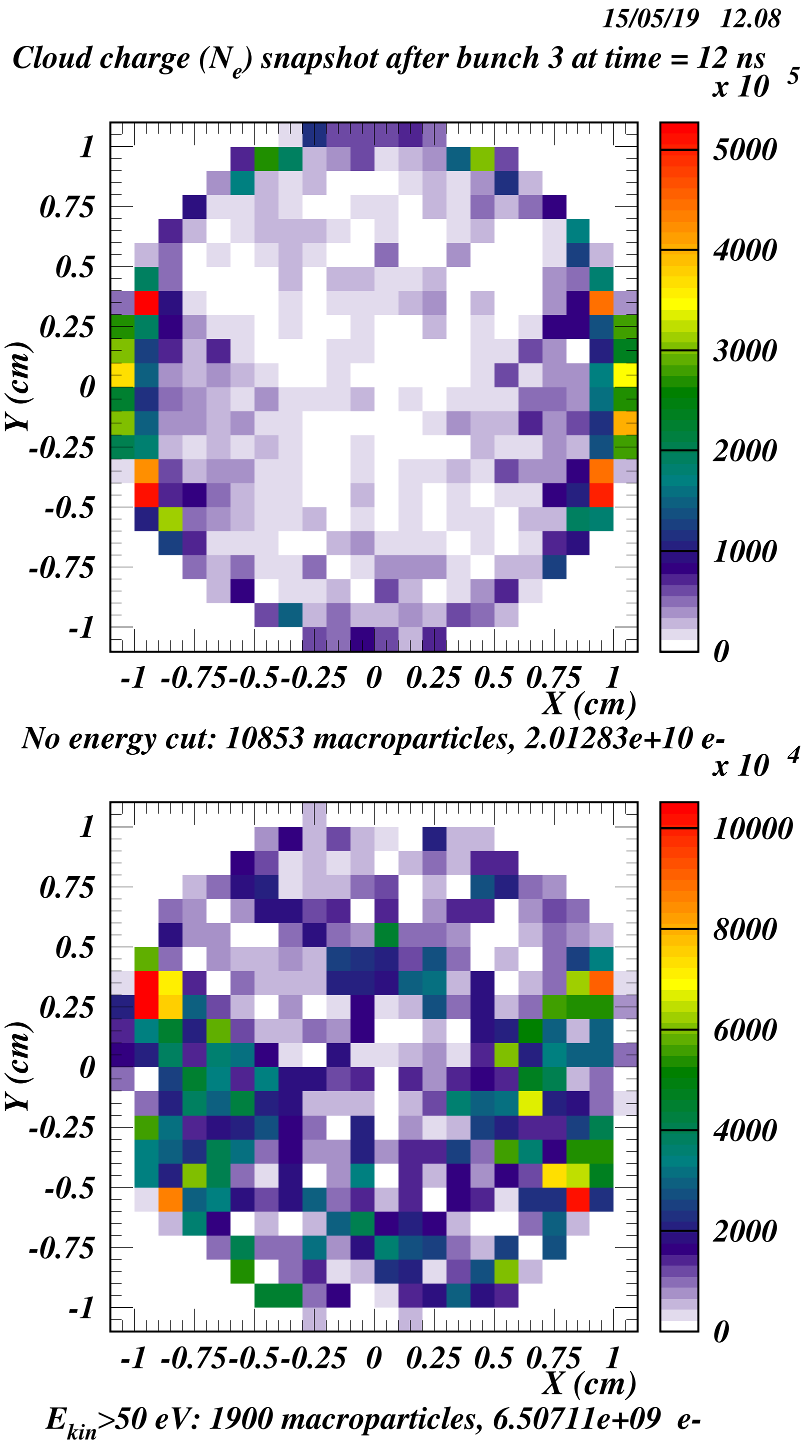
Cloud energy (eV) snapshot after bunch 2 at time = 8 ns



No energy cut: 6305 macroparticles, 1.33285e+10 e-

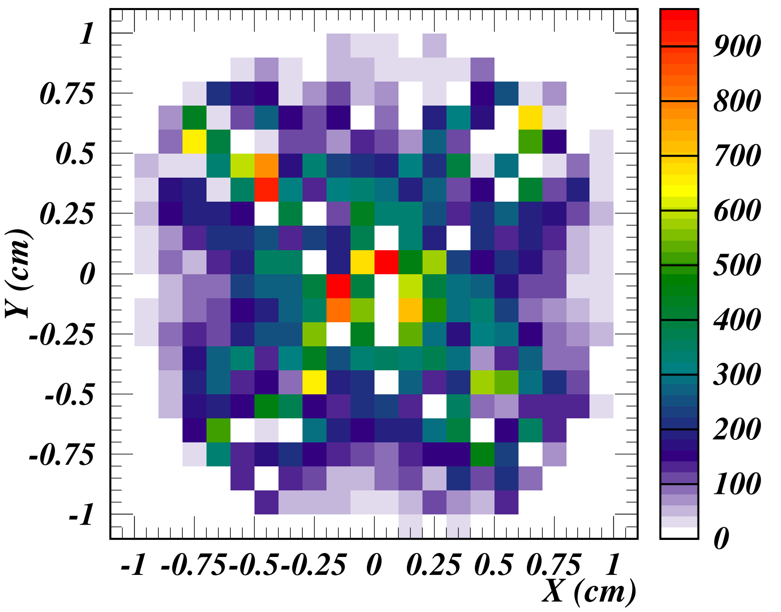


E_{kin}>50 eV: 894 macroparticles, 3.6418e+09 e-

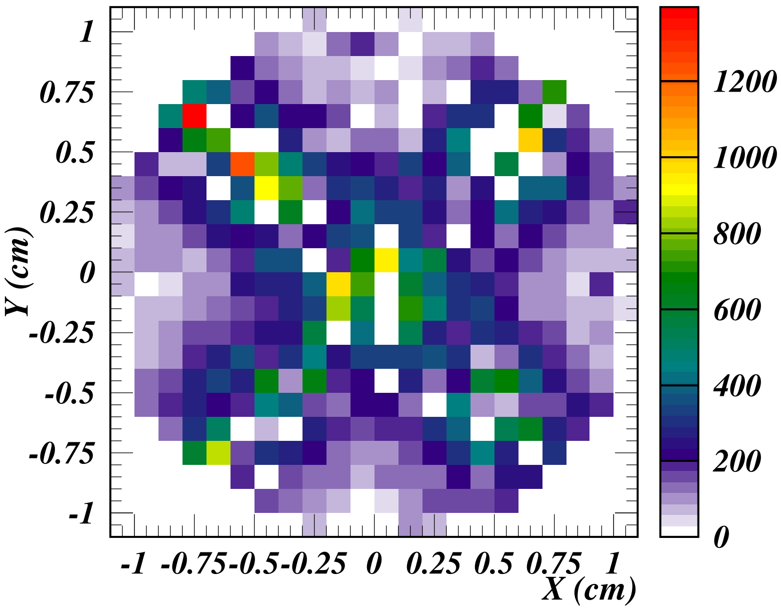

15/05/19 12.08
Cloud charge (N_e) snapshot after bunch 3 at time = 12 ns
x 10^5
Y (cm)
X (cm)
1
0.75
0.5
0.25
0
-0.25
-0.5
-0.75
-1
0.25
0.5
0.75
1
5000
4000
3000
2000
1000
0
No energy cut: 10853 macroparticles, 2.01283e+10 e-
x 10^4
10000
8000
6000
4000
2000
0
E_{kin}>50 eV: 1900 macroparticles, 6.50711e+09 e-

15/05/19 12.08

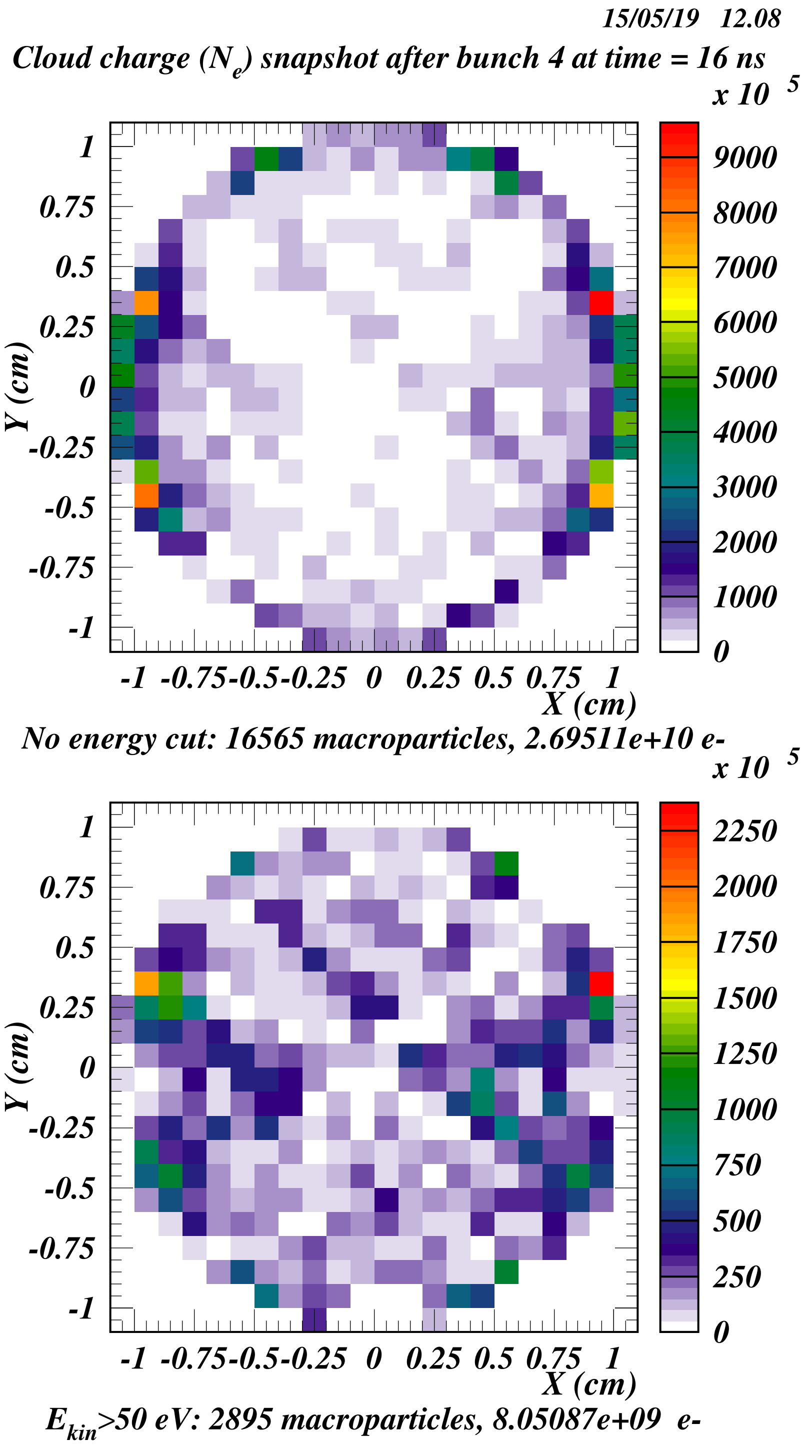
Cloud energy (eV) snapshot after bunch 3 at time = 12 ns



No energy cut: 10853 macroparticles, 2.01283e+10 e-



E_{kin}>50 eV: 1900 macroparticles, 6.50711e+09 e-


15/05/19 12.08
Cloud charge (N_e) snapshot after bunch 4 at time = 16 ns
x 10 5
Y (cm)
X (cm)
1
0.75
0.5
0.25
0
-0.25
-0.5
-0.75
-1
-1 -0.75 -0.5 -0.25 0 0.25 0.5 0.75 1
9000
8000
7000
6000
5000
4000
3000
2000
1000
0
No energy cut: 16565 macroparticles, 2.69511e+10 e-
x 10 5
2250
2000
1750
1500
1250
1000
750
500
250
0
E_{kin}>50 eV: 2895 macroparticles, 8.05087e+09 e-

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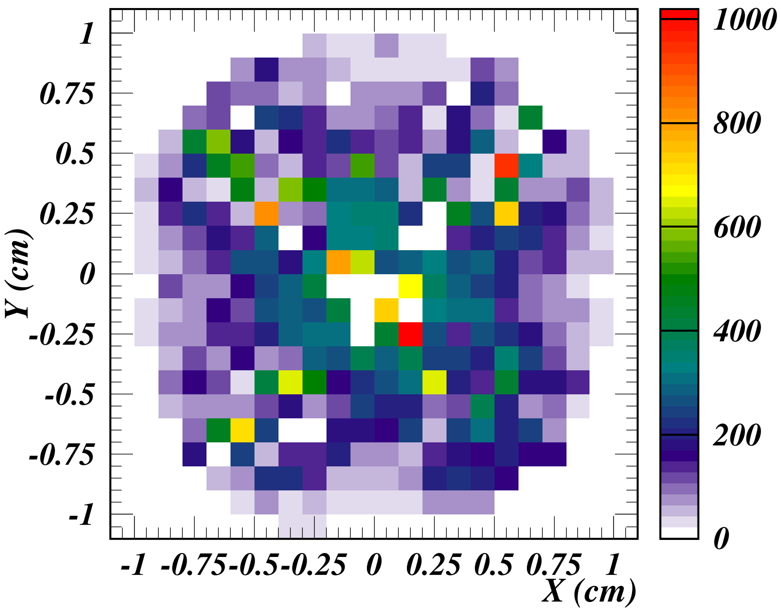
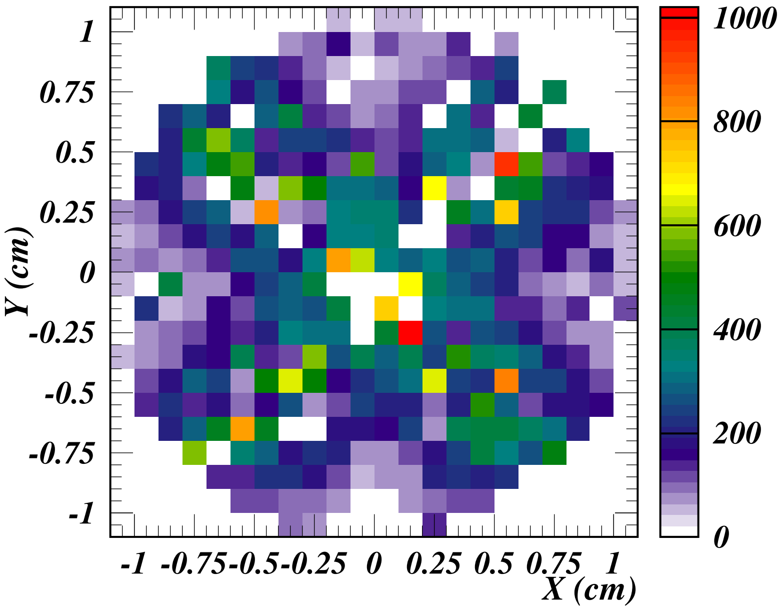
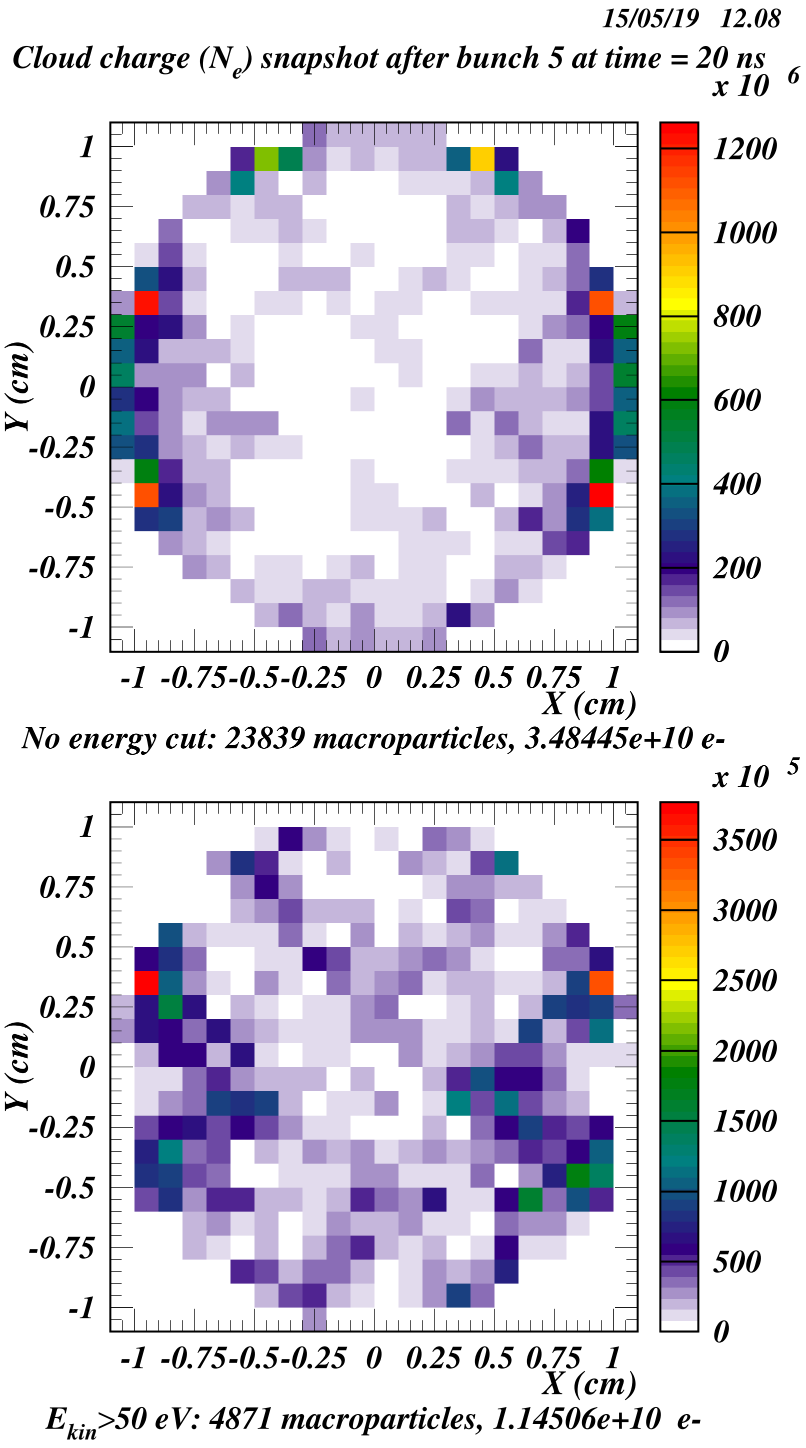
Cloud energy (eV) snapshot after bunch 4 at time = 16 ns



No energy cut: 16565 macroparticles, 2.69511e+10 e-

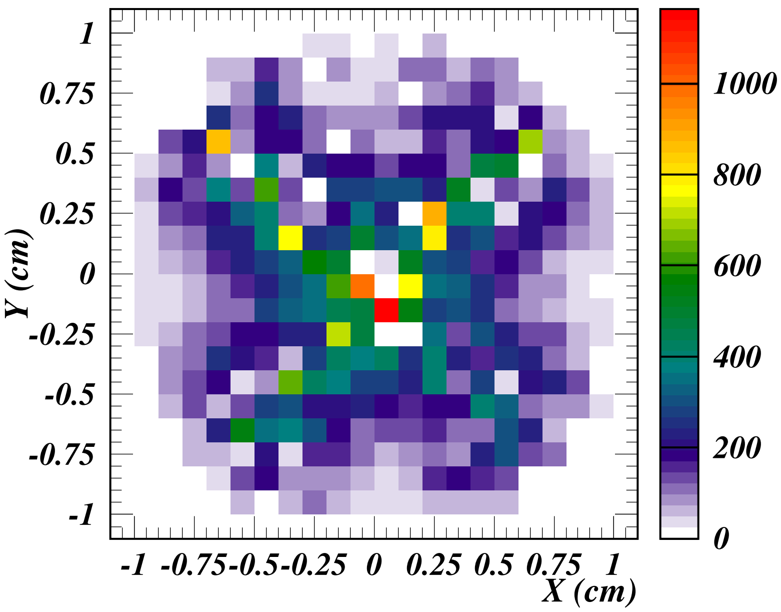


E_{kin}>50 eV: 2895 macroparticles, 8.05087e+09 e-

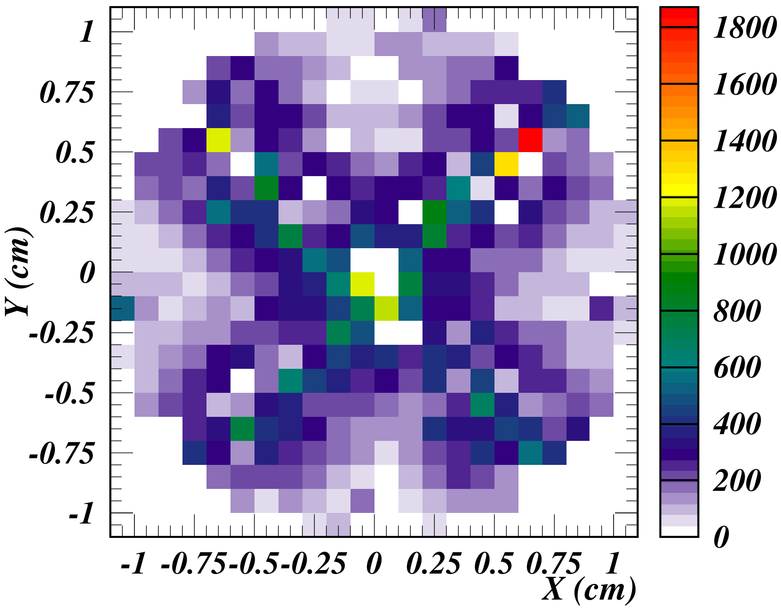

15/05/19 12.08
Cloud charge (N_e) snapshot after bunch 5 at time = 20 ns
x 10^6
1200
1000
800
600
400
200
0
1
0.75
0.5
0.25
0
-0.25
-0.5
-0.75
-1
Y (cm)
-1 -0.75 -0.5 -0.25 0 0.25 0.5 0.75 1
X (cm)
No energy cut: 23839 macroparticles, 3.48445e+10 e-
x 10^5
3500
3000
2500
2000
1500
1000
500
0
Y (cm)
X (cm)
E_{kin}>50 eV: 4871 macroparticles, 1.14506e+10 e-

15/05/19 12.08

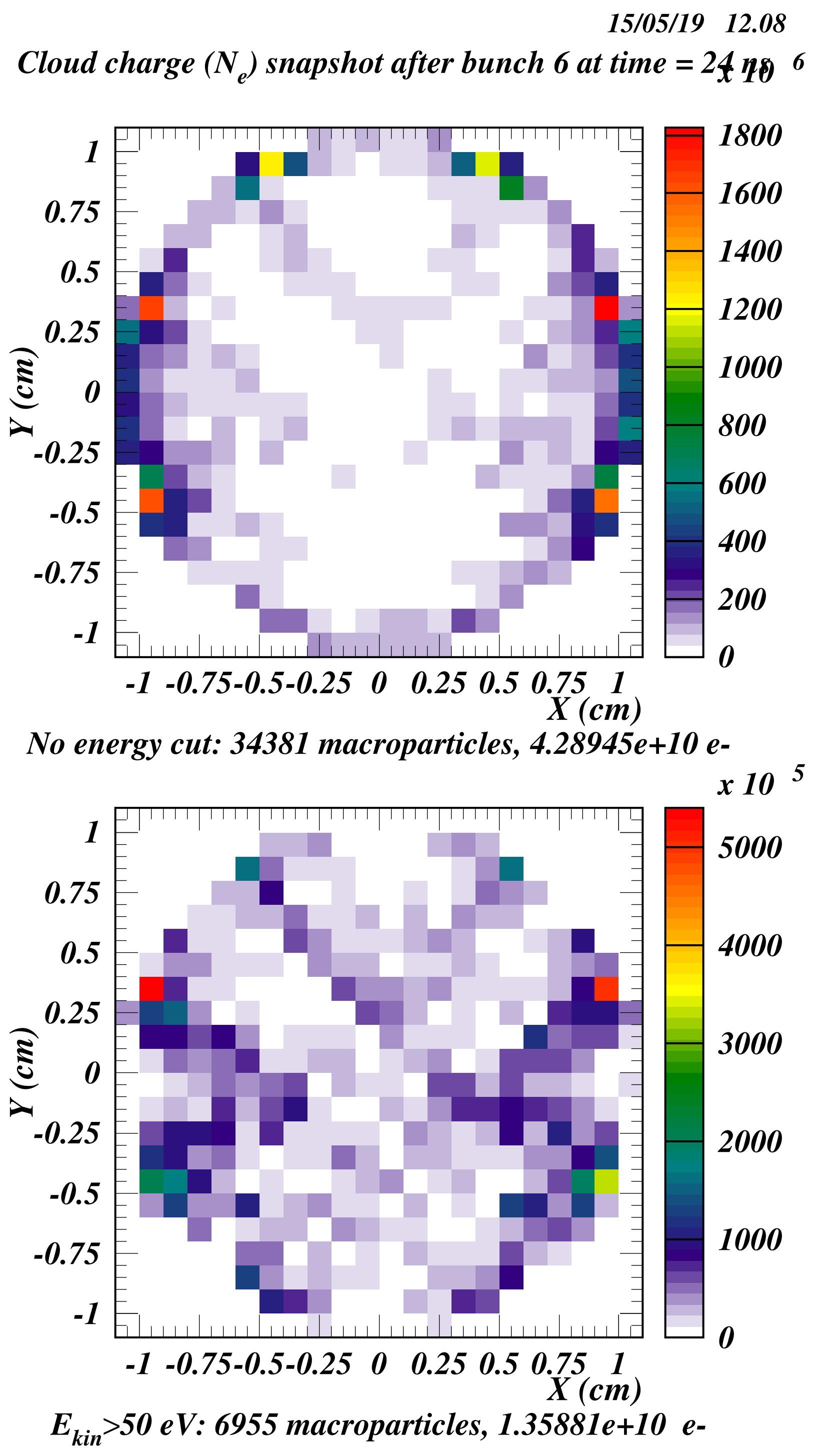
Cloud energy (eV) snapshot after bunch 5 at time = 20 ns



No energy cut: 23839 macroparticles, 3.48445e+10 e-

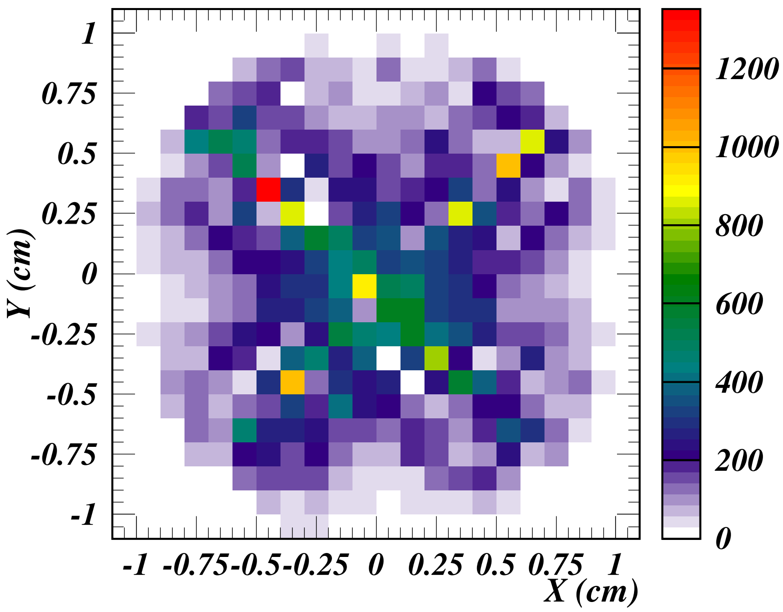


E_{kin}>50 eV: 4871 macroparticles, 1.14506e+10 e-

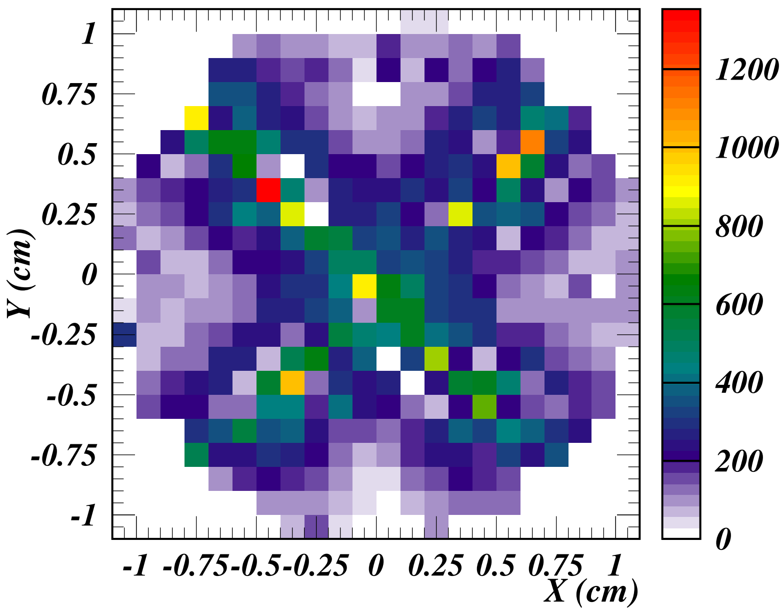

15/05/19 12.08
Cloud charge (N_e) snapshot after bunch 6 at time = 24 ns
x 10 6
1800
1600
1400
1200
1000
800
600
400
200
0
Y (cm)
X (cm)
1
0.75
0.5
0.25
0
-0.25
-0.5
-0.75
-1
-1 -0.75 -0.5 -0.25 0 0.25 0.5 0.75 1
No energy cut: 34381 macroparticles, 4.28945e+10 e-
x 10 5
5000
4000
3000
2000
1000
0
Y (cm)
X (cm)
1
0.75
0.5
0.25
0
-0.25
-0.5
-0.75
-1
-1 -0.75 -0.5 -0.25 0 0.25 0.5 0.75 1
E_{kin}>50 eV: 6955 macroparticles, 1.35881e+10 e-

15/05/19 12.09

Cloud energy (eV) snapshot after bunch 6 at time = 24 ns



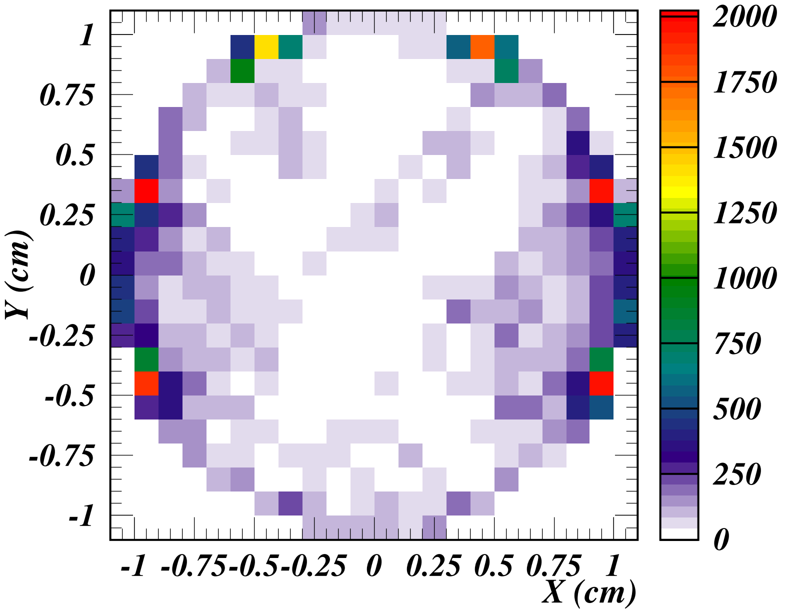
No energy cut: 34381 macroparticles, 4.28945e+10 e-



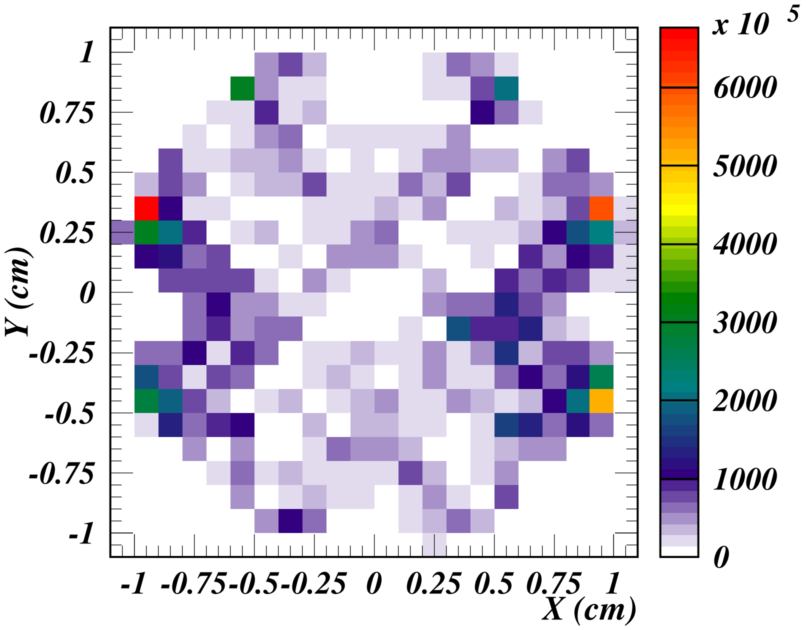
E_{kin}>50 eV: 6955 macroparticles, 1.35881e+10 e-

15/05/19 12.09

Cloud charge (N_e) snapshot after bunch 7 at time = 28 ns



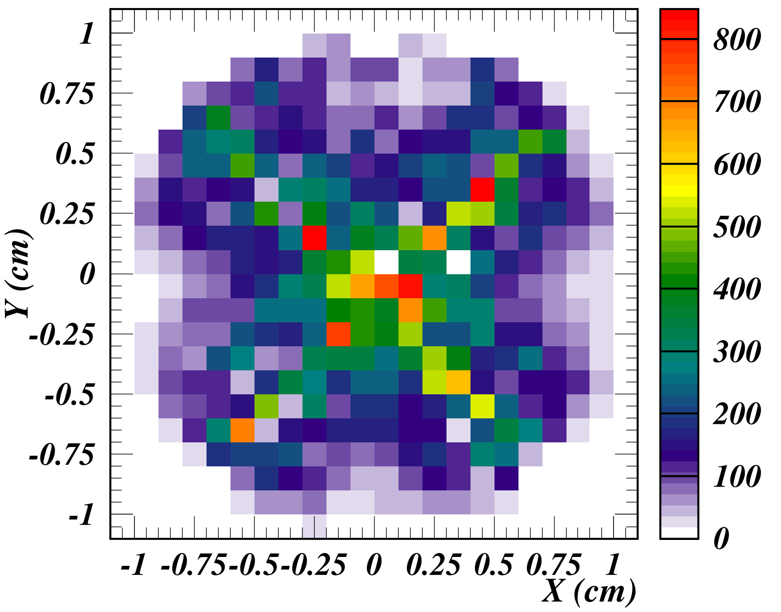
No energy cut: 48879 macroparticles, 4.9917e+10 e-



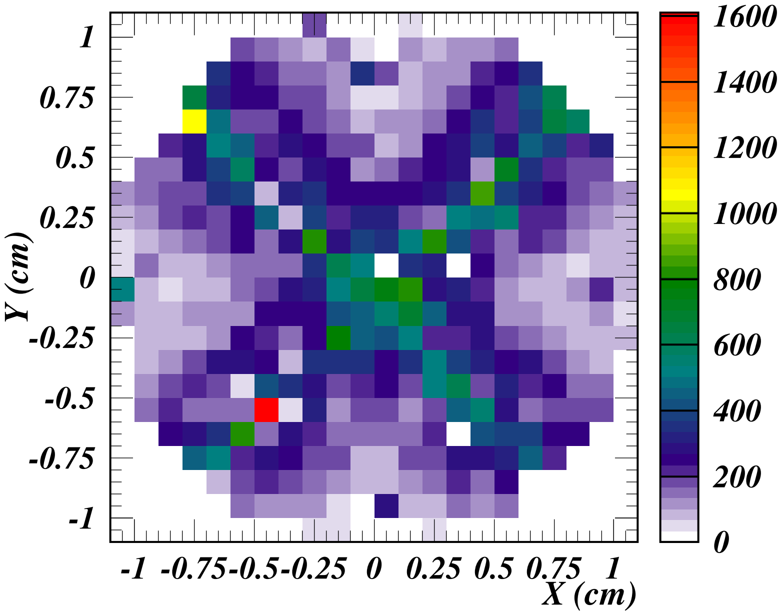
E_{kin}>50 eV: 11160 macroparticles, 1.71841e+10 e-

15/05/19 12.09

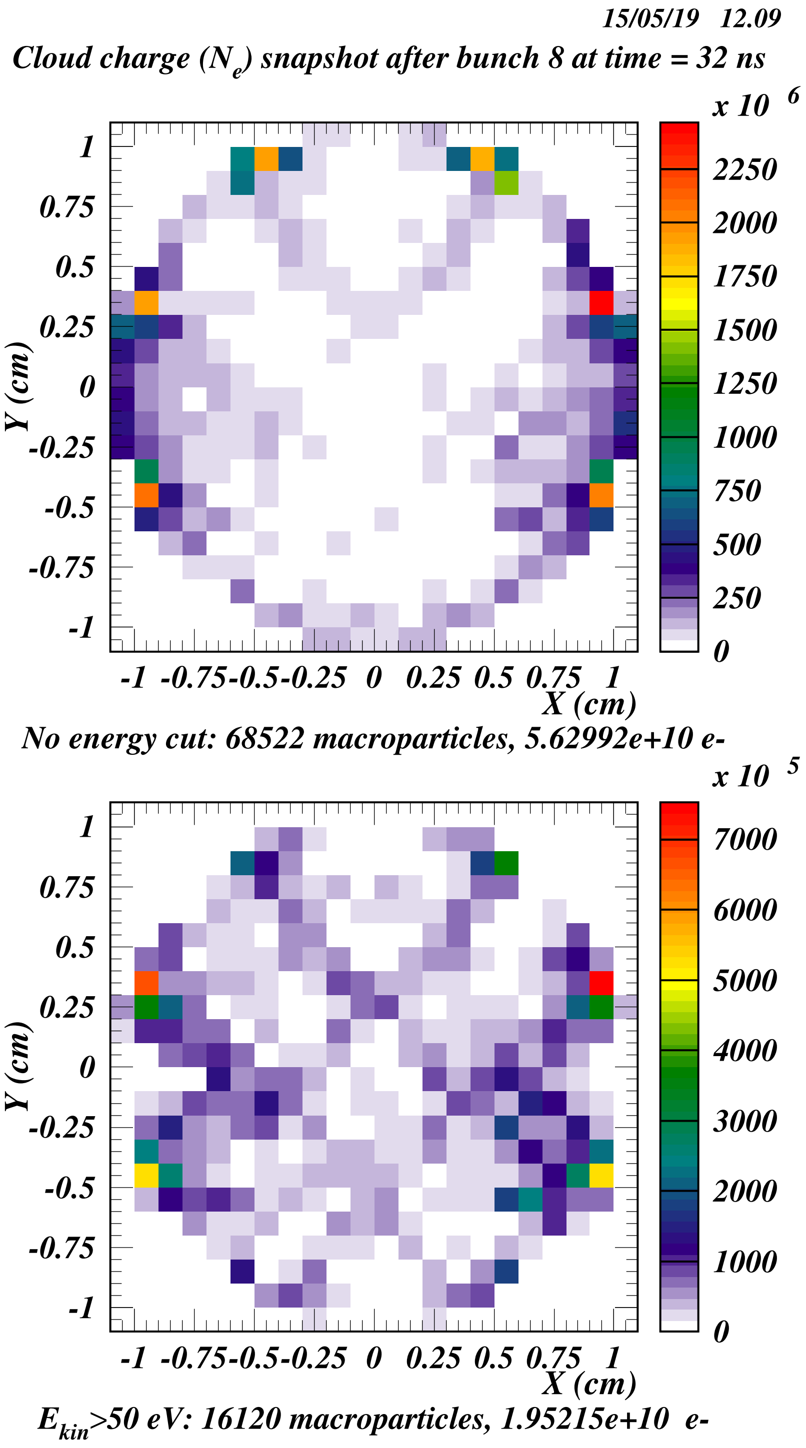
Cloud energy (eV) snapshot after bunch 7 at time = 28 ns



No energy cut: 48879 macroparticles, 4.9917e+10 e-



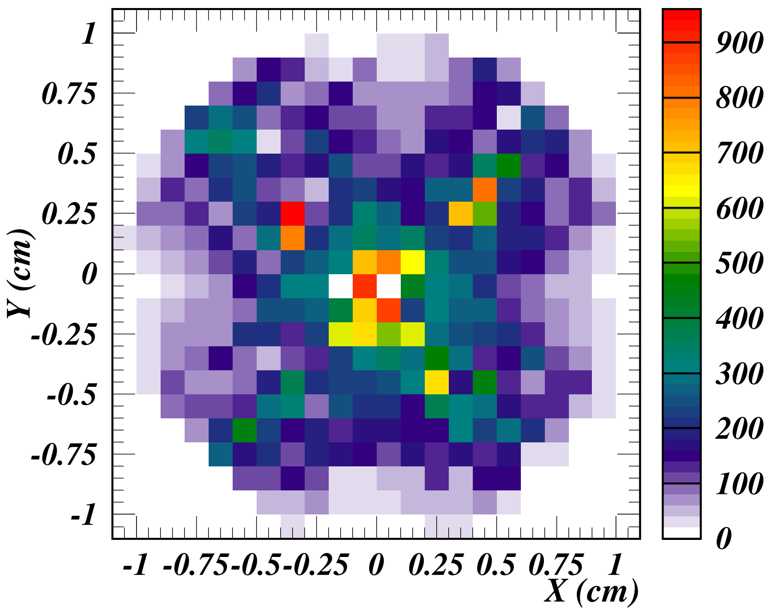
E_{kin}>50 eV: 11160 macroparticles, 1.71841e+10 e-



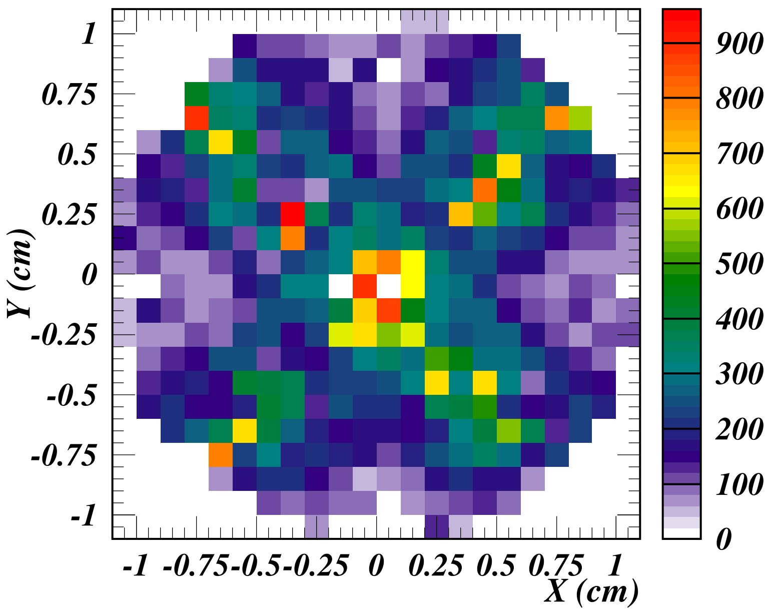
15/05/19 12.09
Cloud charge (N_e) snapshot after bunch 8 at time = 32 ns
x 10 6
Y (cm)
X (cm)
No energy cut: 68522 macroparticles, 5.62992e+10 e-
x 10 5
Y (cm)
X (cm)
E_{kin}>50 eV: 16120 macroparticles, 1.95215e+10 e-

15/05/19   12.09

Cloud energy (eV) snapshot after bunch 8 at time = 32 ns



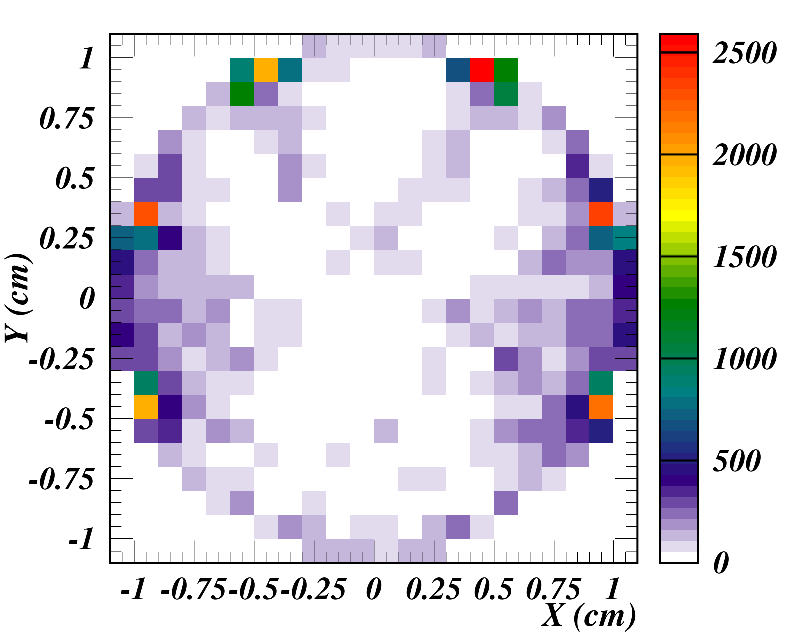
No energy cut: 68522 macroparticles, 5.62992e+10 e-



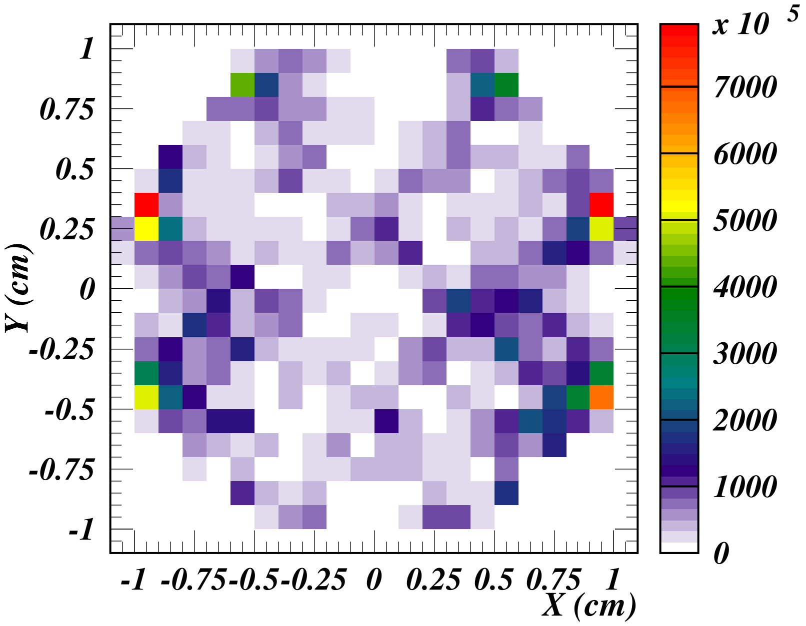
E_{kin}>50 eV: 16120 macroparticles, 1.95215e+10 e-

15/05/19   12.09

Cloud charge (N_e) snapshot after bunch 9 at time = 36 ns



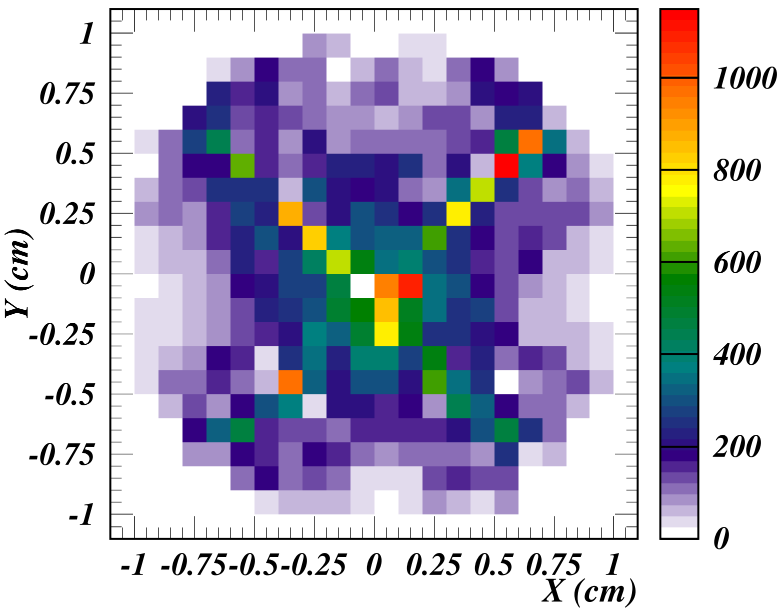
No energy cut: 93287 macroparticles, 6.14951e+10 e-



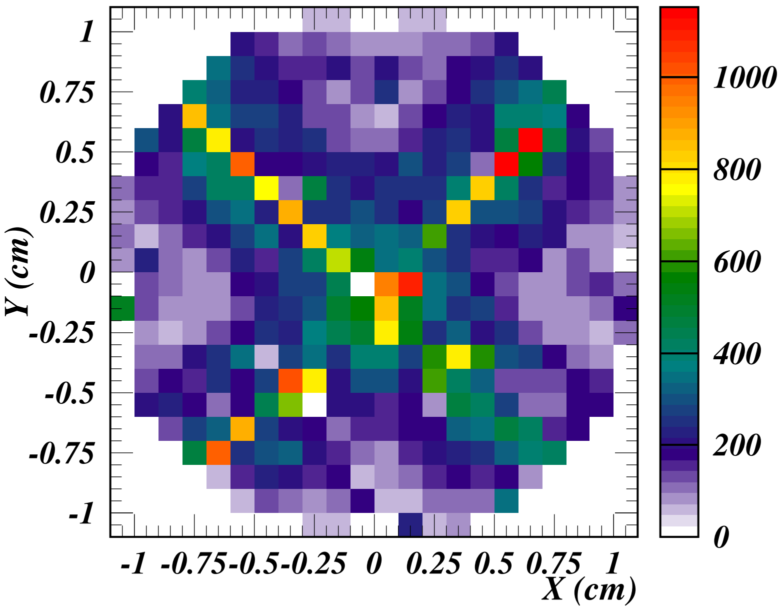
E_{kin}>50 eV: 22902 macroparticles, 2.26717e+10 e-

15/05/19 12.09

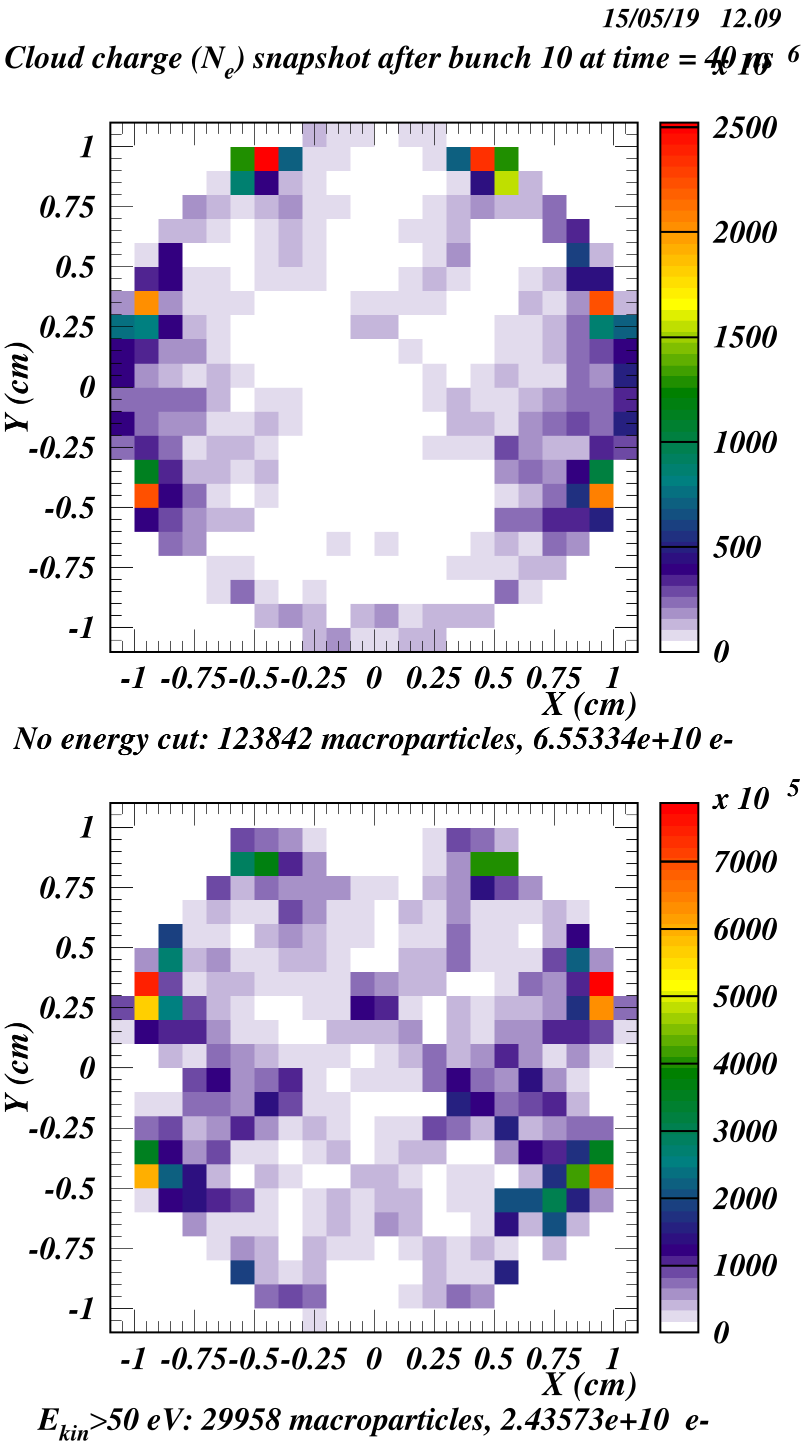
Cloud energy (eV) snapshot after bunch 9 at time = 36 ns

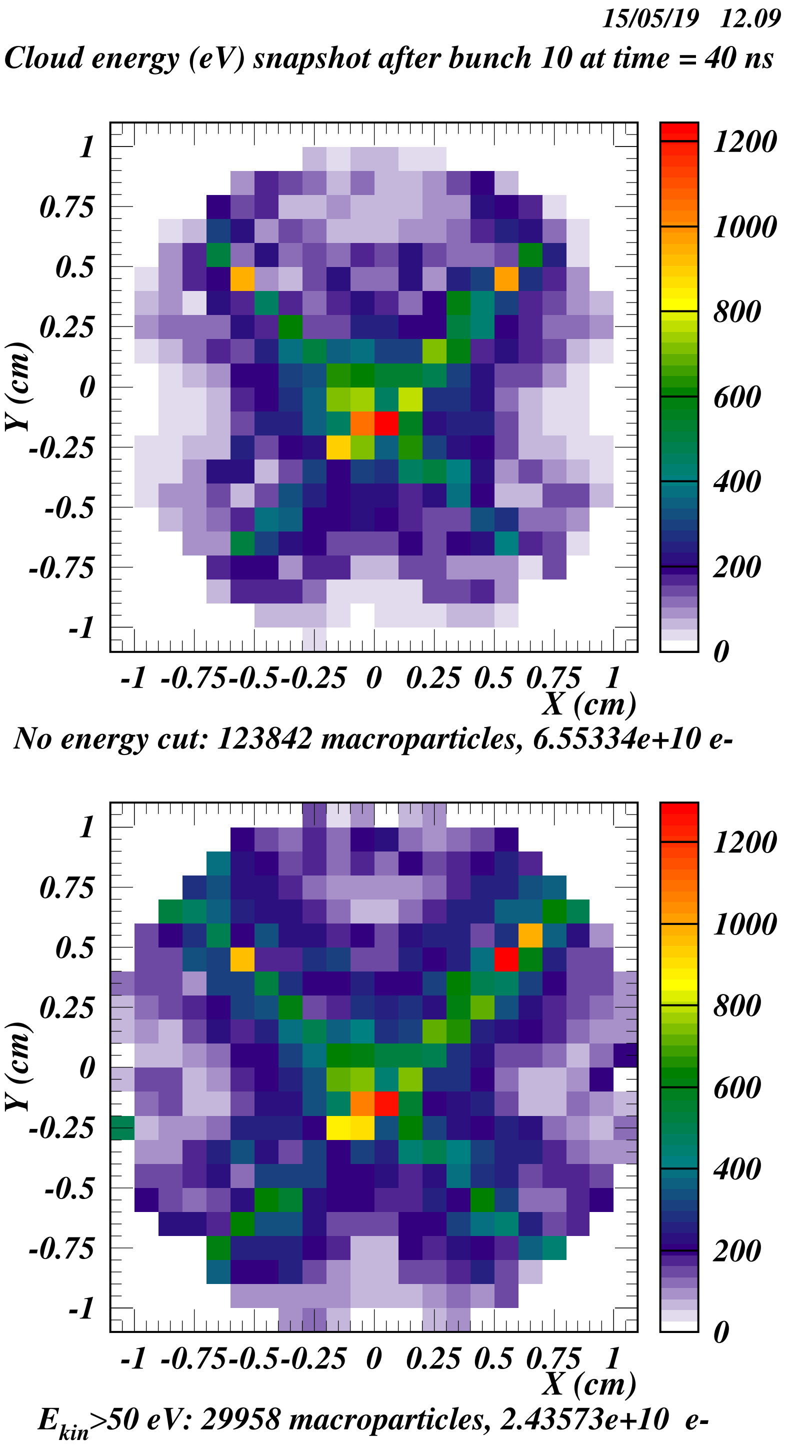


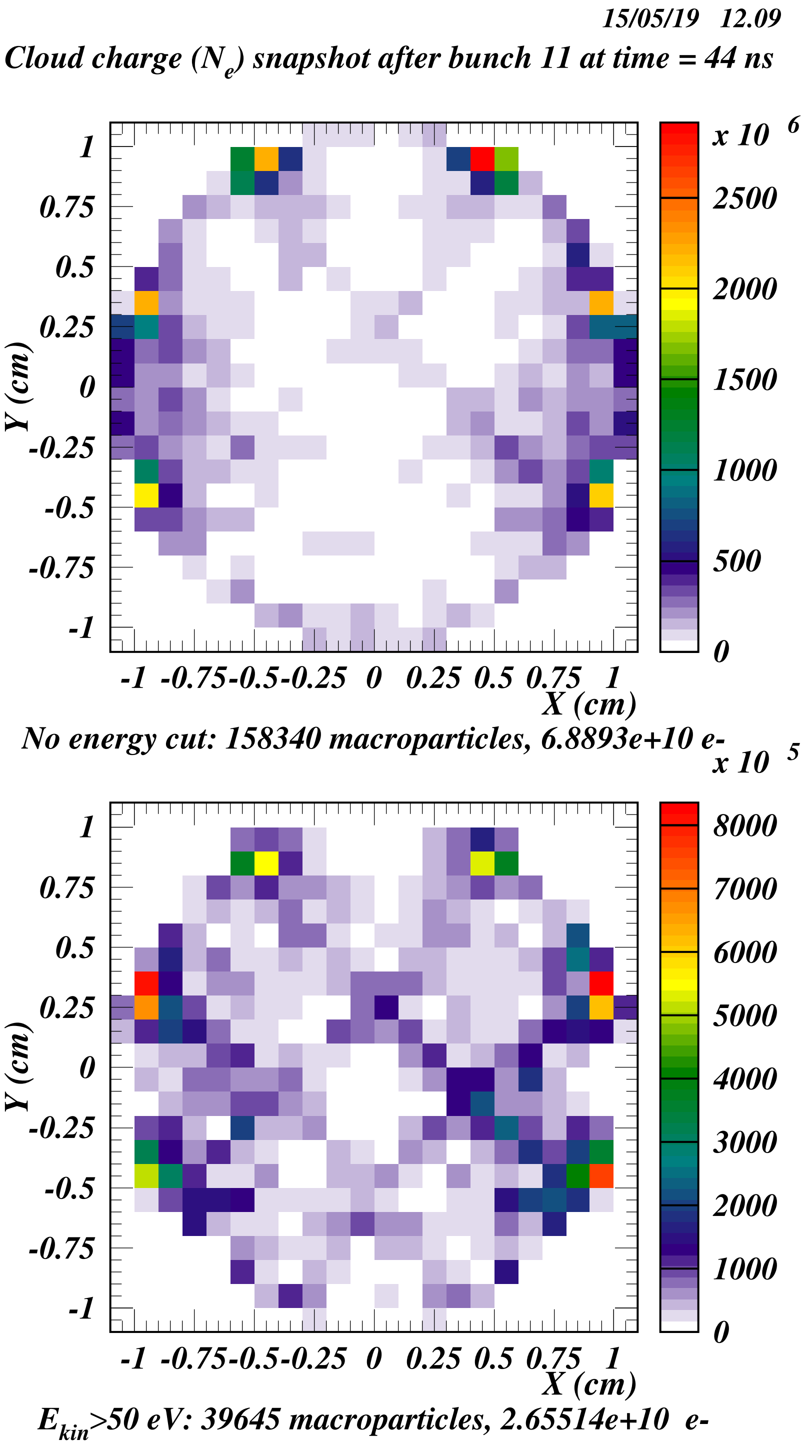
No energy cut: 93287 macroparticles, 6.14951e+10 e-



E_{kin}>50 eV: 22902 macroparticles, 2.26717e+10 e-

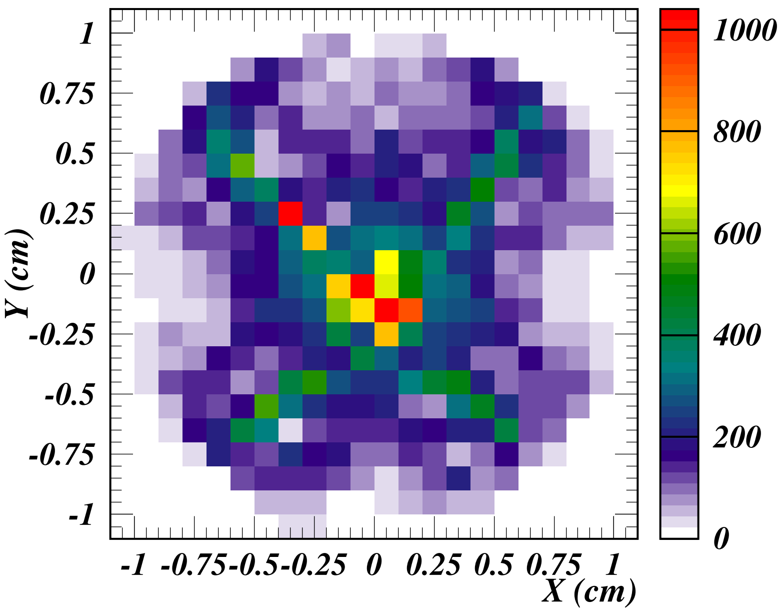

15/05/19 12.09
Cloud charge (N_e) snapshot after bunch 10 at time = 40 ns
x 10 6
2500
2000
1500
1000
500
0
Y (cm)
X (cm)
No energy cut: 123842 macroparticles, 6.55334e+10 e-
x 10 5
7000
6000
5000
4000
3000
2000
1000
0
Y (cm)
X (cm)
E_{kin}>50 eV: 29958 macroparticles, 2.43573e+10 e-


15/05/19 12.09
Cloud energy (eV) snapshot after bunch 10 at time = 40 ns
Y (cm)
X (cm)
1
0.75
0.5
0.25
0
-0.25
-0.5
-0.75
-1
-1 -0.75 -0.5 -0.25 0 0.25 0.5 0.75 1
0
200
400
600
800
1000
1200
No energy cut: 123842 macroparticles, 6.55334e+10 e-
Y (cm)
X (cm)
1
0.75
0.5
0.25
0
-0.25
-0.5
-0.75
-1
-1 -0.75 -0.5 -0.25 0 0.25 0.5 0.75 1
0
200
400
600
800
1000
1200
E_kin>50 eV: 29958 macroparticles, 2.43573e+10 e-

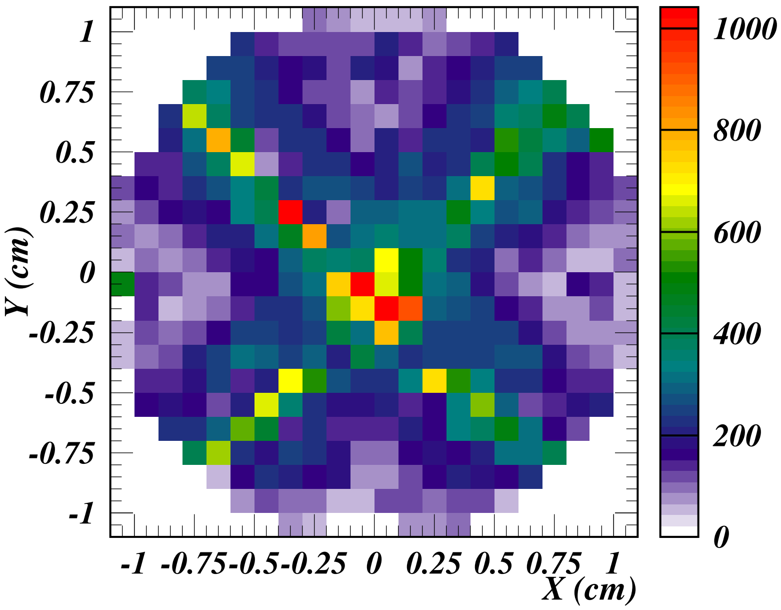

15/05/19 12.09
Cloud charge (N_e) snapshot after bunch 11 at time = 44 ns
Y (cm)
X (cm)
x 10 6
2500
2000
1500
1000
500
0
No energy cut: 158340 macroparticles, 6.8893e+10 e-
x 10 5
8000
7000
6000
5000
4000
3000
2000
1000
0
E_{kin}>50 eV: 39645 macroparticles, 2.65514e+10 e-

15/05/19 12.09

Cloud energy (eV) snapshot after bunch 11 at time = 44 ns



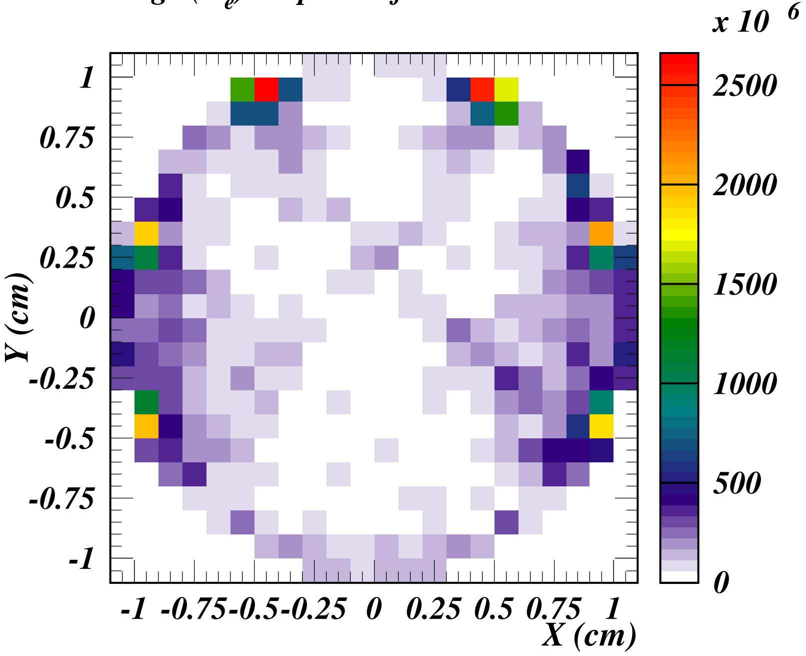
No energy cut: 158340 macroparticles, 6.8893e+10 e-



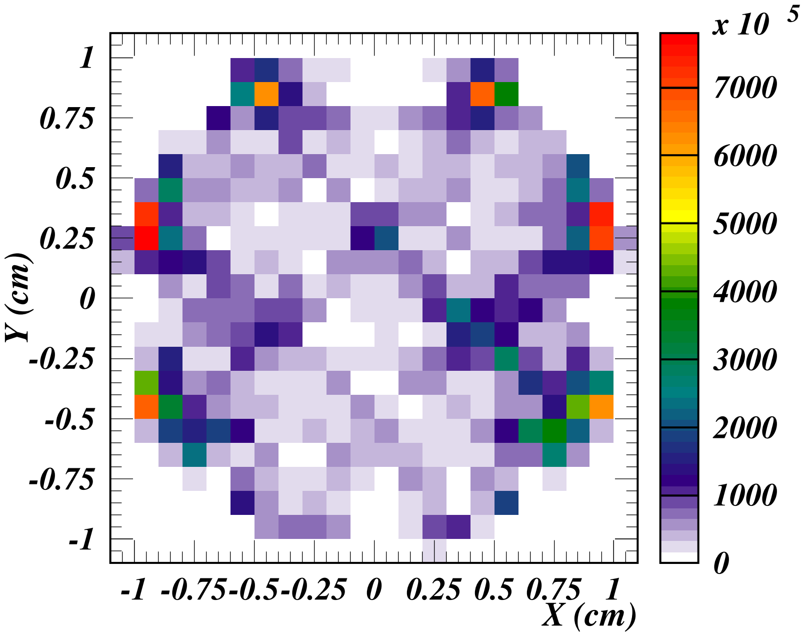
E_{kin}>50 eV: 39645 macroparticles, 2.65514e+10 e-

15/05/19 12.10

Cloud charge (N_e) snapshot after bunch 12 at time = 48 ns



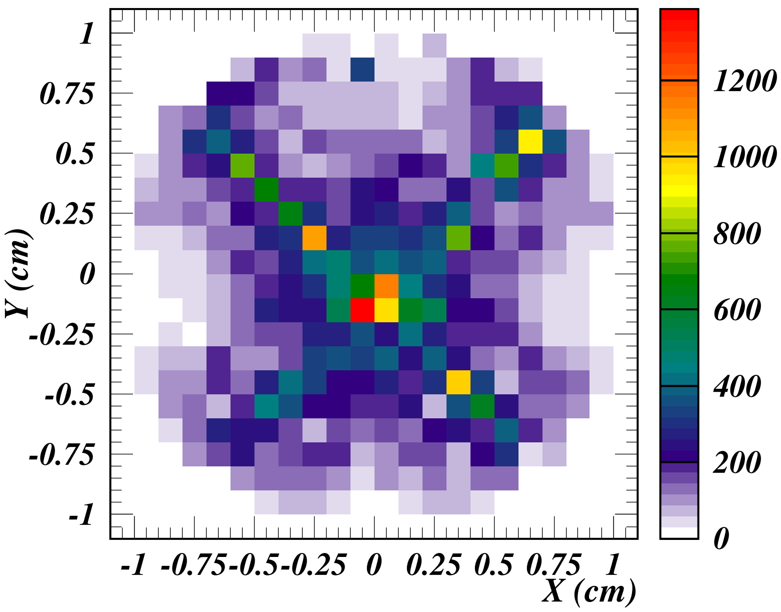
No energy cut: 197248 macroparticles, 7.07301e+10 e-



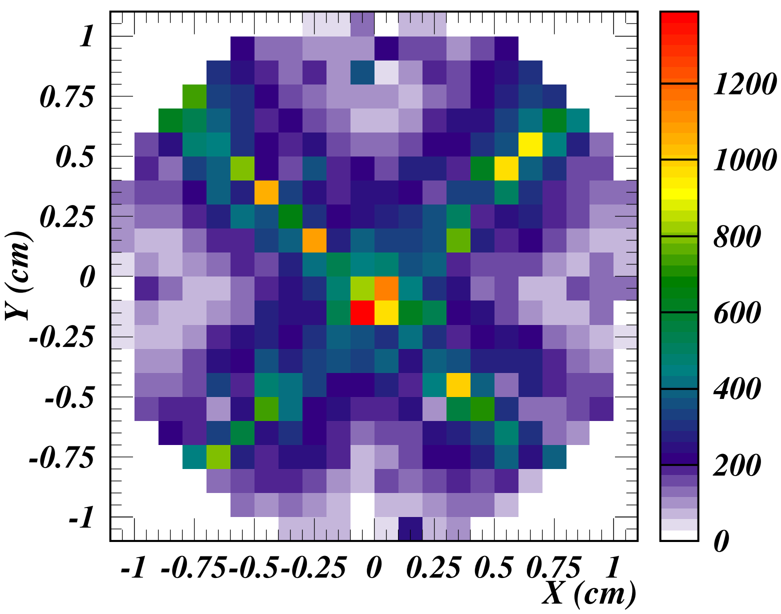
E_{kin}>50 eV: 50386 macroparticles, 2.85481e+10 e-

15/05/19 12.10

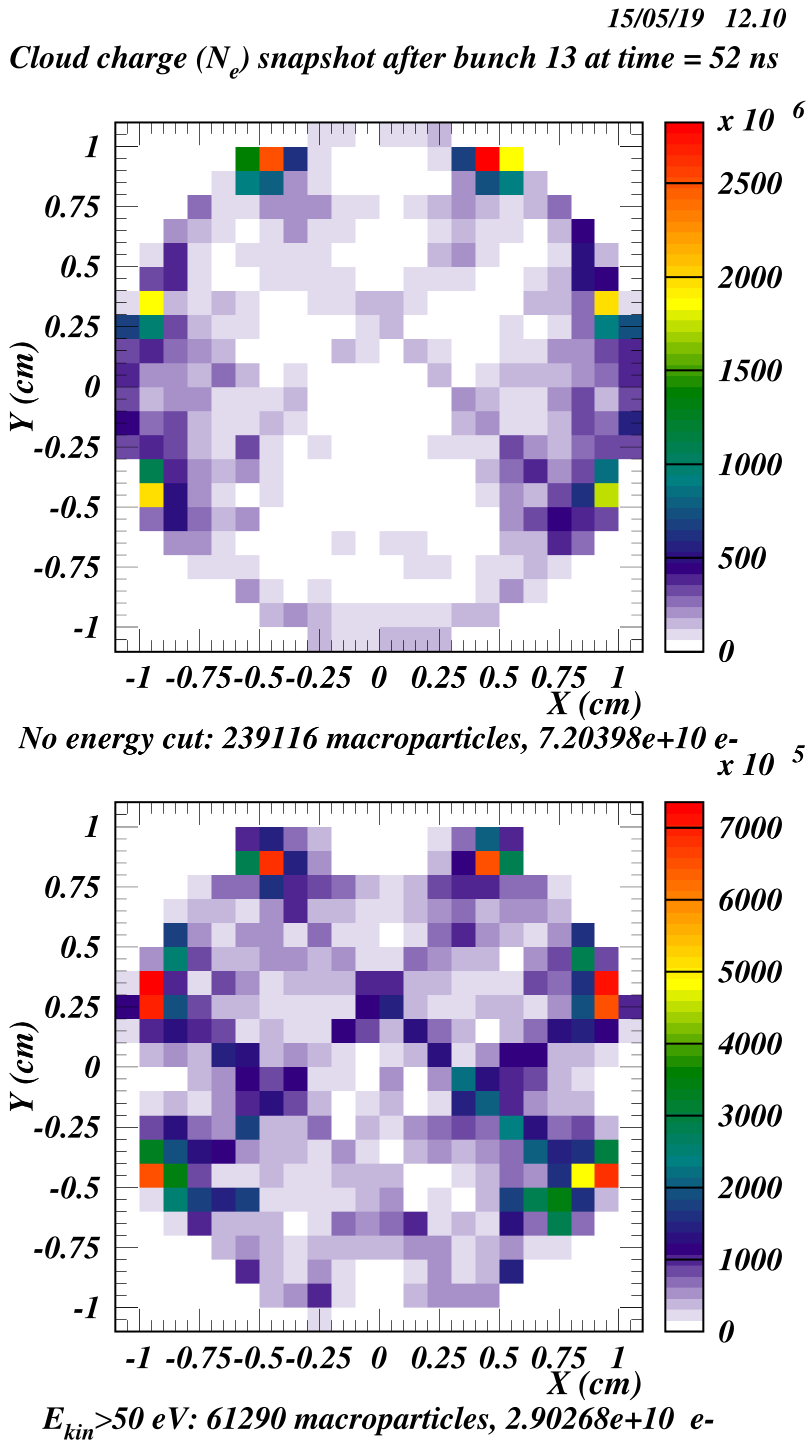
Cloud energy (eV) snapshot after bunch 12 at time = 48 ns



No energy cut: 197248 macroparticles, 7.07301e+10 e-

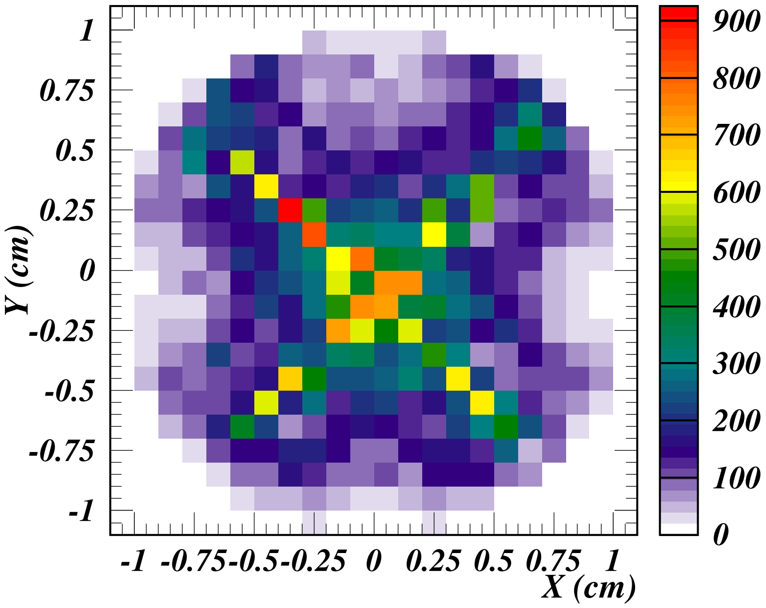


E_{kin}>50 eV: 50386 macroparticles, 2.85481e+10 e-

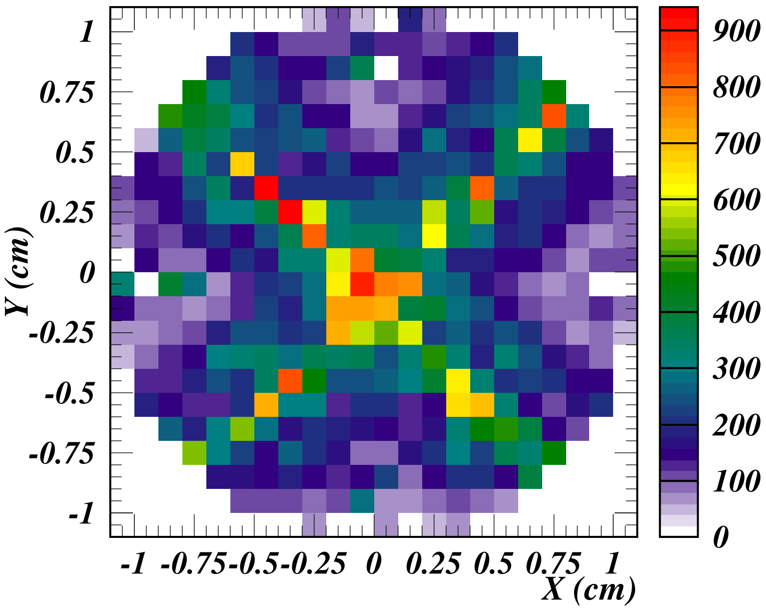

15/05/19 12.10
Cloud charge (N_e) snapshot after bunch 13 at time = 52 ns
Y (cm)
X (cm)
x 10 ^{6}
2500
2000
1500
1000
500
0
No energy cut: 239116 macroparticles, 7.20398e+10 e-
x 10 ^{5}
7000
6000
5000
4000
3000
2000
1000
0
Y (cm)
X (cm)
E_{kin}>50 eV: 61290 macroparticles, 2.90268e+10 e-

15/05/19 12.10

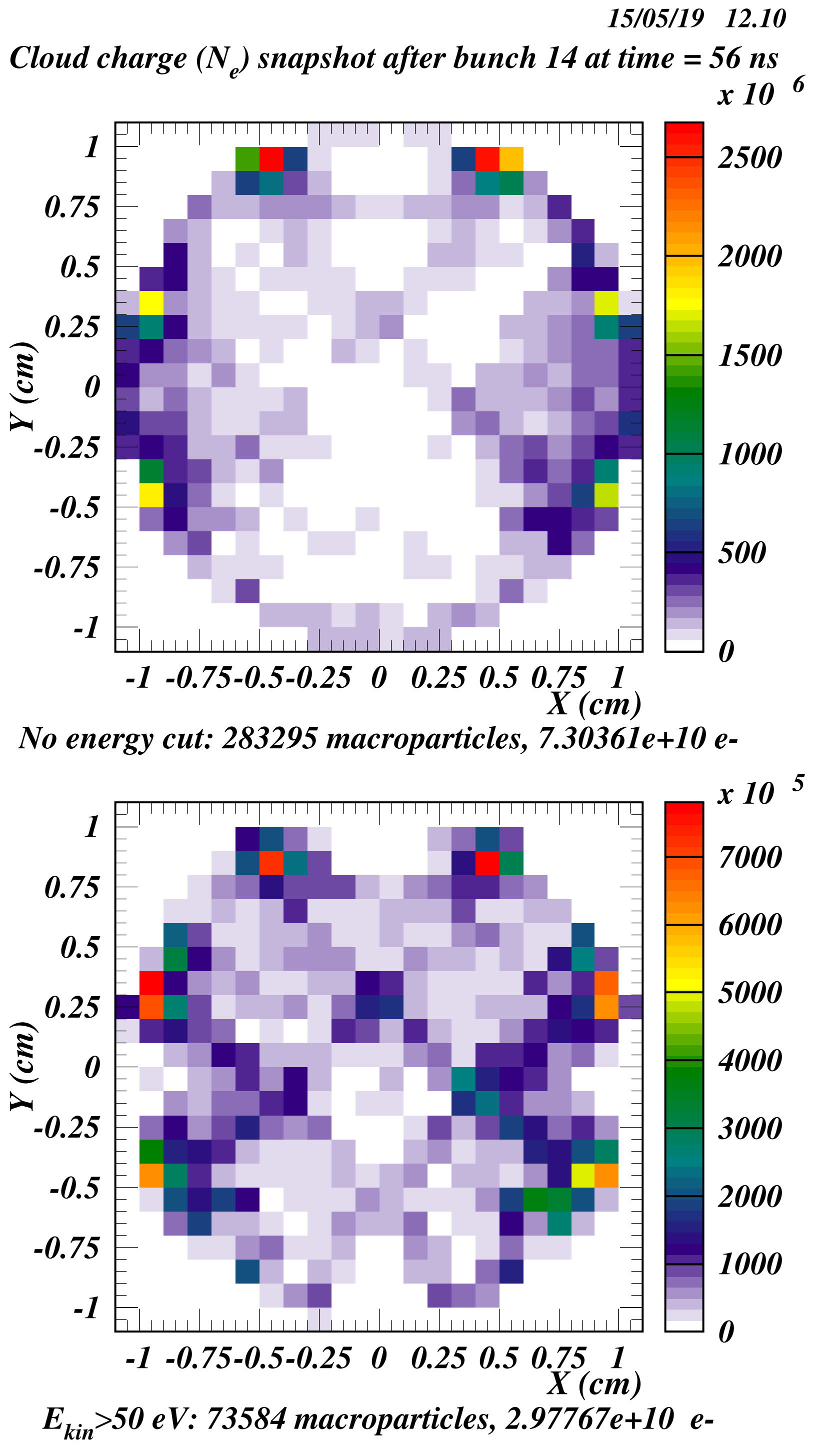
Cloud energy (eV) snapshot after bunch 13 at time = 52 ns



No energy cut: 239116 macroparticles, 7.20398e+10 e-

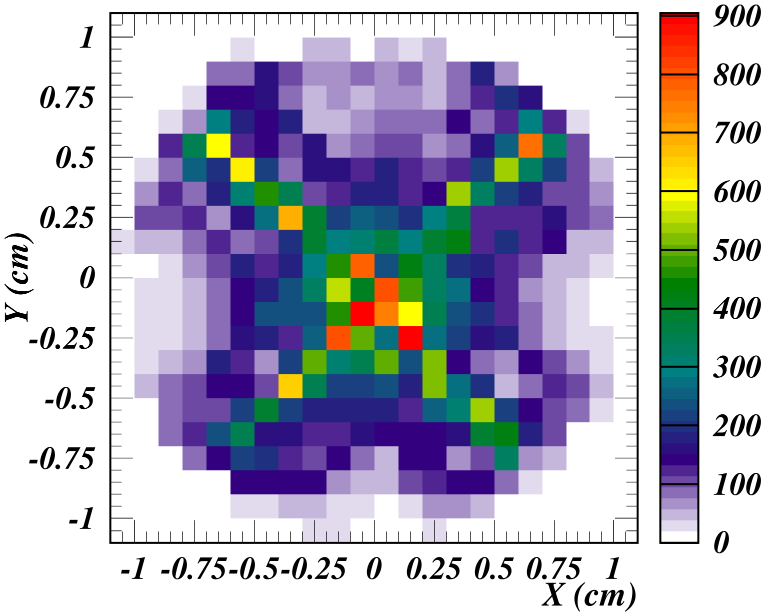


E_{kin}>50 eV: 61290 macroparticles, 2.90268e+10 e-

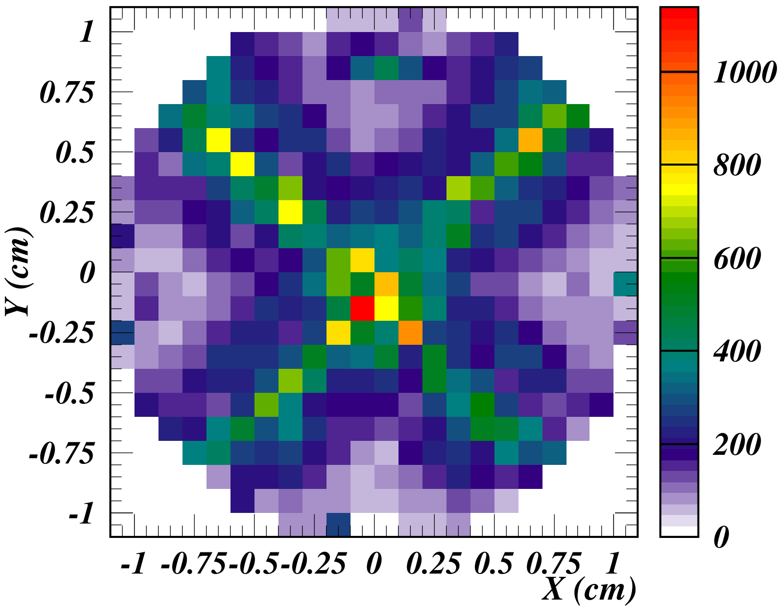

15/05/19 12.10
Cloud charge (N_e) snapshot after bunch 14 at time = 56 ns
x 10 6
Y (cm)
X (cm)
No energy cut: 283295 macroparticles, 7.30361e+10 e-
x 10 5
Y (cm)
X (cm)
E_{kin}>50 eV: 73584 macroparticles, 2.97767e+10 e-

15/05/19 12.10

Cloud energy (eV) snapshot after bunch 14 at time = 56 ns



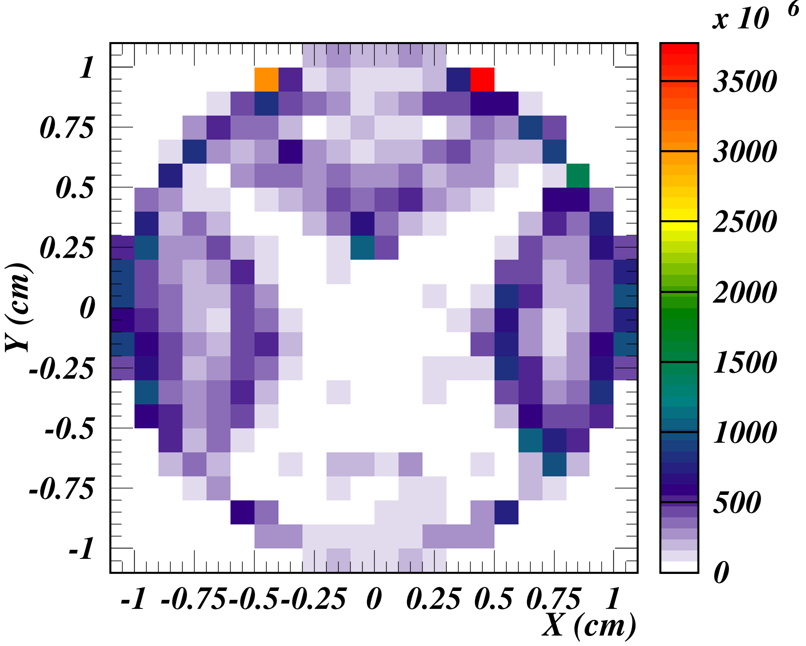
No energy cut: 283295 macroparticles, 7.30361e+10 e-



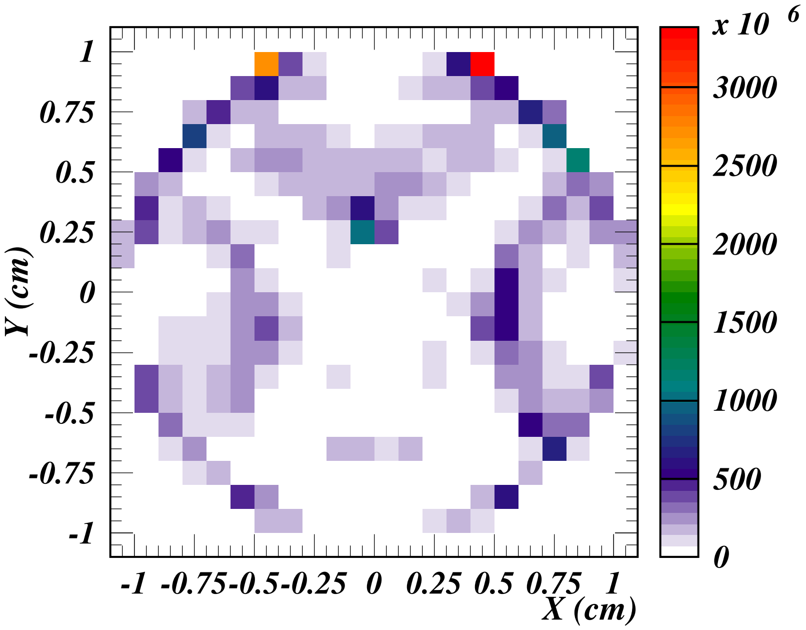
E_{kin}>50 eV: 73584 macroparticles, 2.97767e+10 e-

15/05/19 12.10

Cloud charge (N_e) snapshot after bunch 100 at time = 396.14 ns



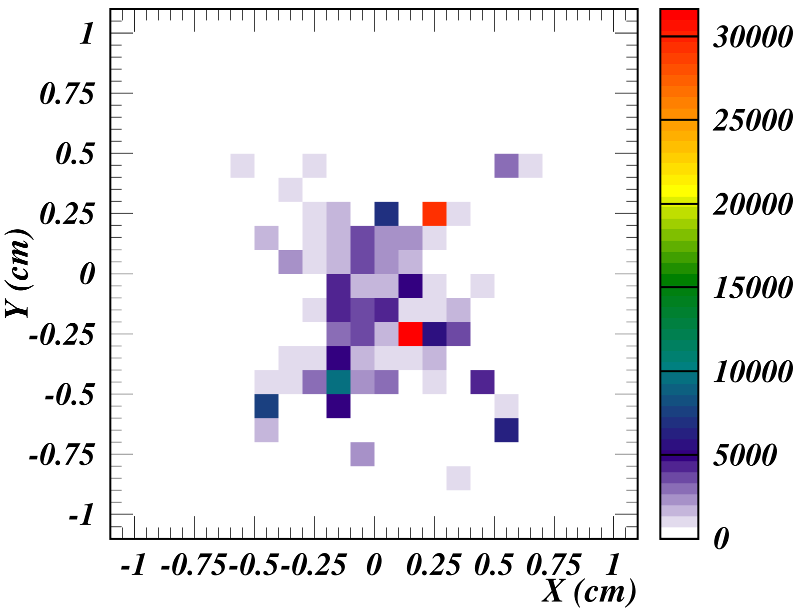
No energy cut: 2000029 macroparticles, 1.05466e+11 e-



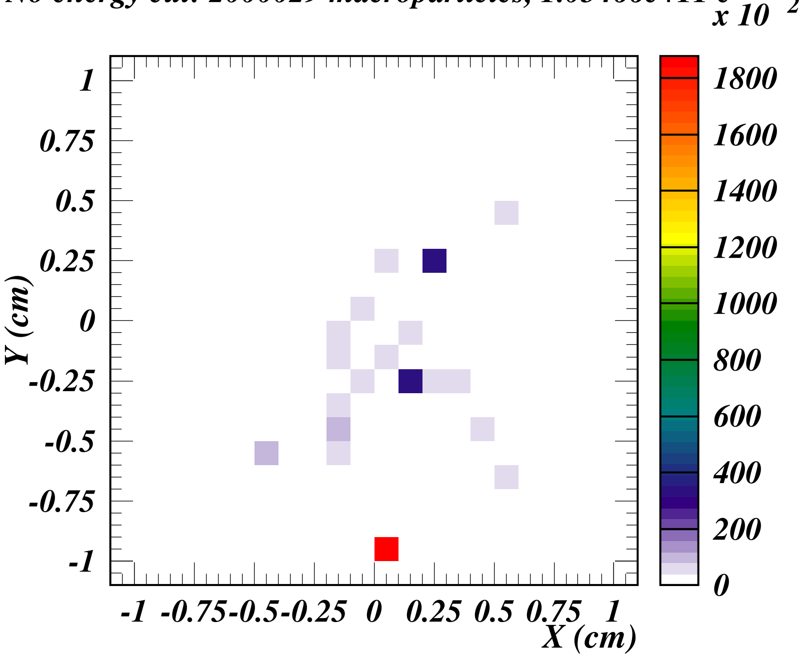
E_{kin}>50 eV: 1385268 macroparticles, 5.51852e+10 e-

15/05/19 12.10

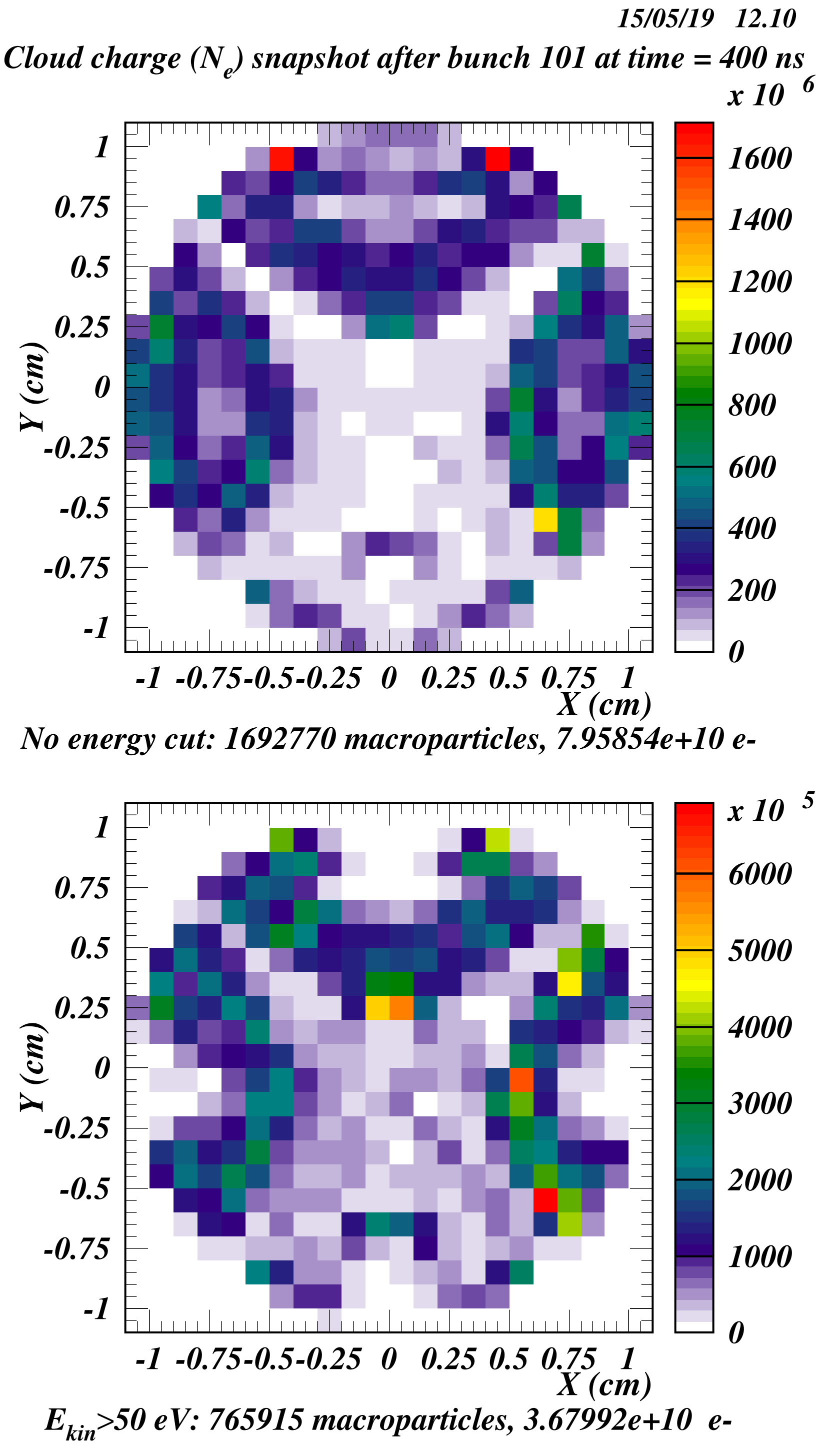
Cloud energy (eV) snapshot after bunch 100 at time = 396.14 ns



No energy cut: 2000029 macroparticles, 1.05466e+11 e-

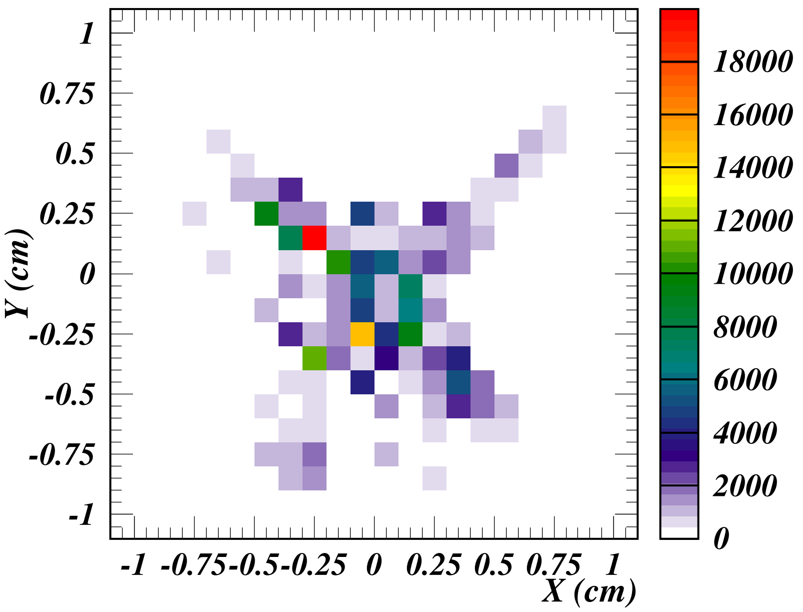


E_{kin}>50 eV: 1385268 macroparticles, 5.51852e+10 e-

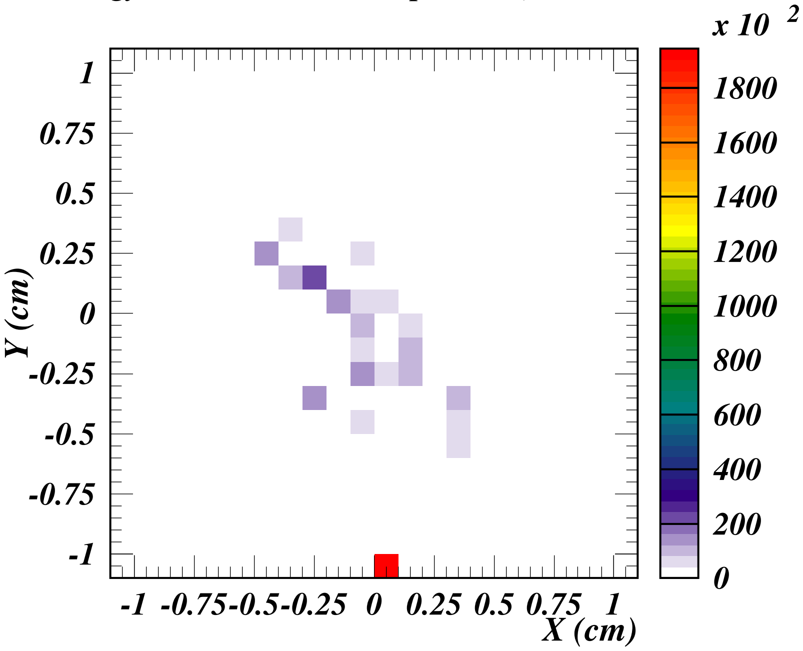

15/05/19 12.10
Cloud charge (N_e) snapshot after bunch 101 at time = 400 ns
x 10 6
1600
1400
1200
1000
800
600
400
200
0
Y (cm)
X (cm)
1
0.75
0.5
0.25
0
-0.25
-0.5
-0.75
-1
-1 -0.75 -0.5 -0.25 0 0.25 0.5 0.75 1
No energy cut: 1692770 macroparticles, 7.95854e+10 e-
x 10 5
6000
5000
4000
3000
2000
1000
0
Y (cm)
X (cm)
E_{kin}>50 eV: 765915 macroparticles, 3.67992e+10 e-

15/05/19 12.10

Cloud energy (eV) snapshot after bunch 101 at time = 400 ns

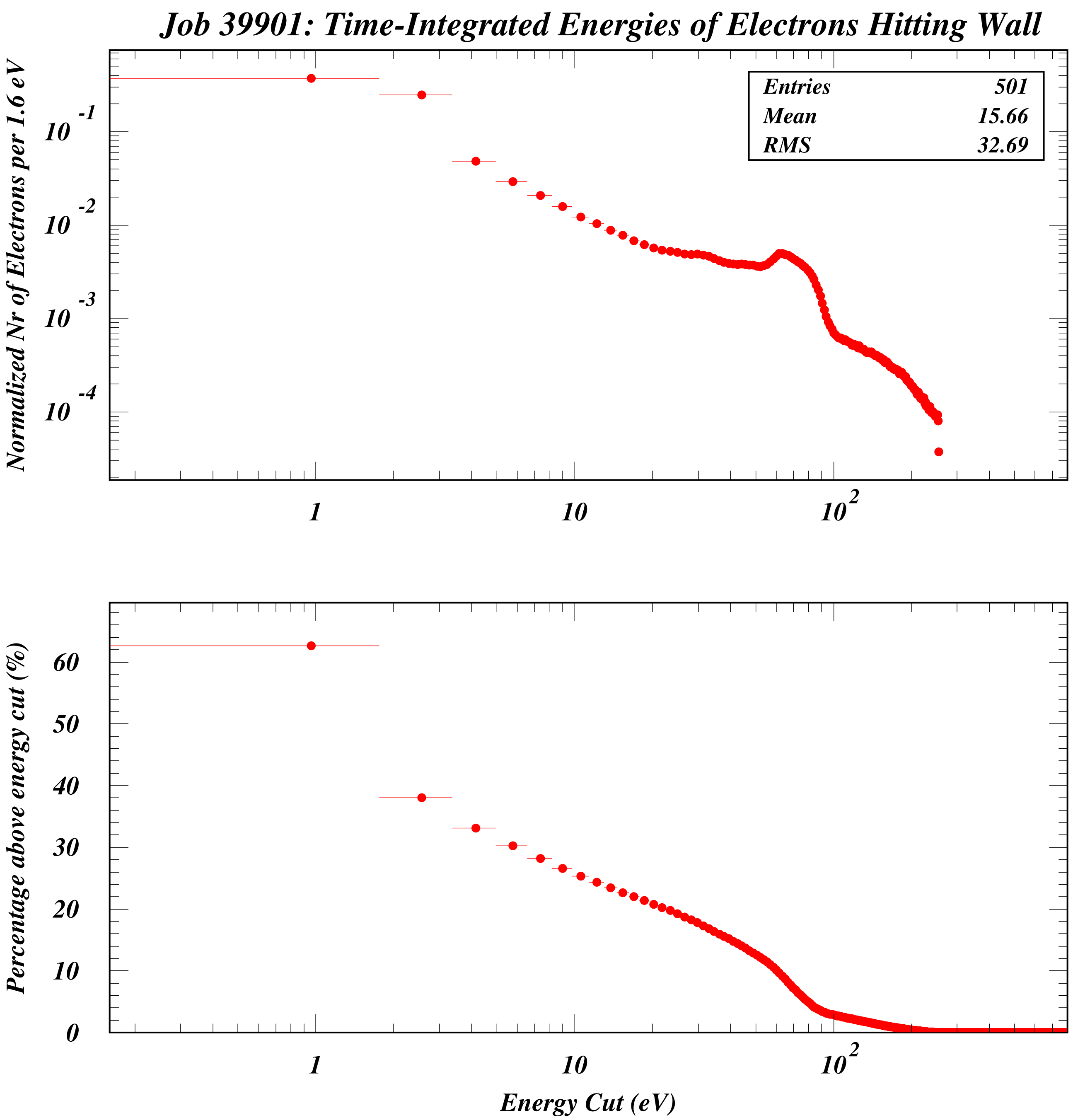


No energy cut: 1692770 macroparticles, 7.95854e+10 e-

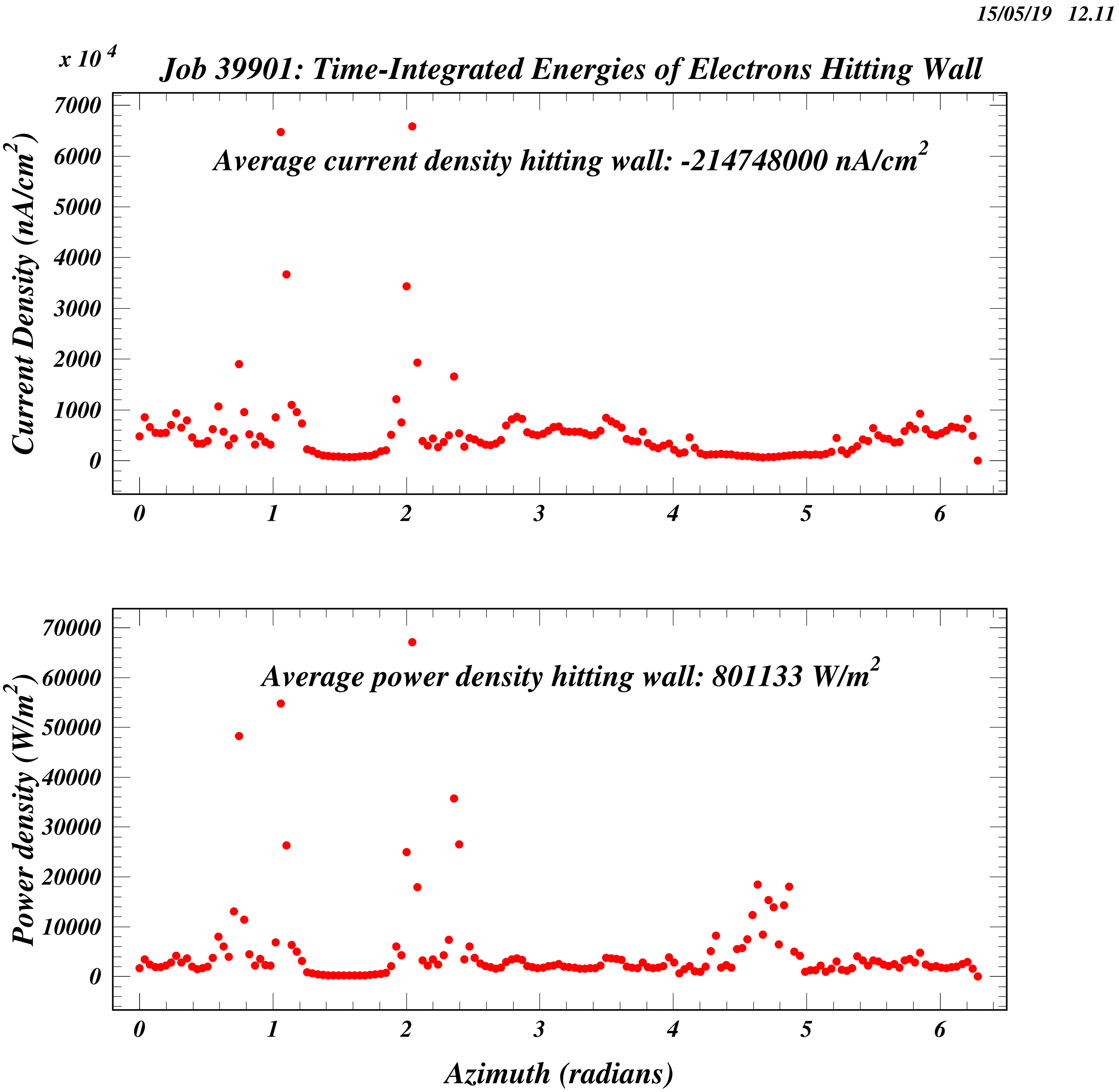


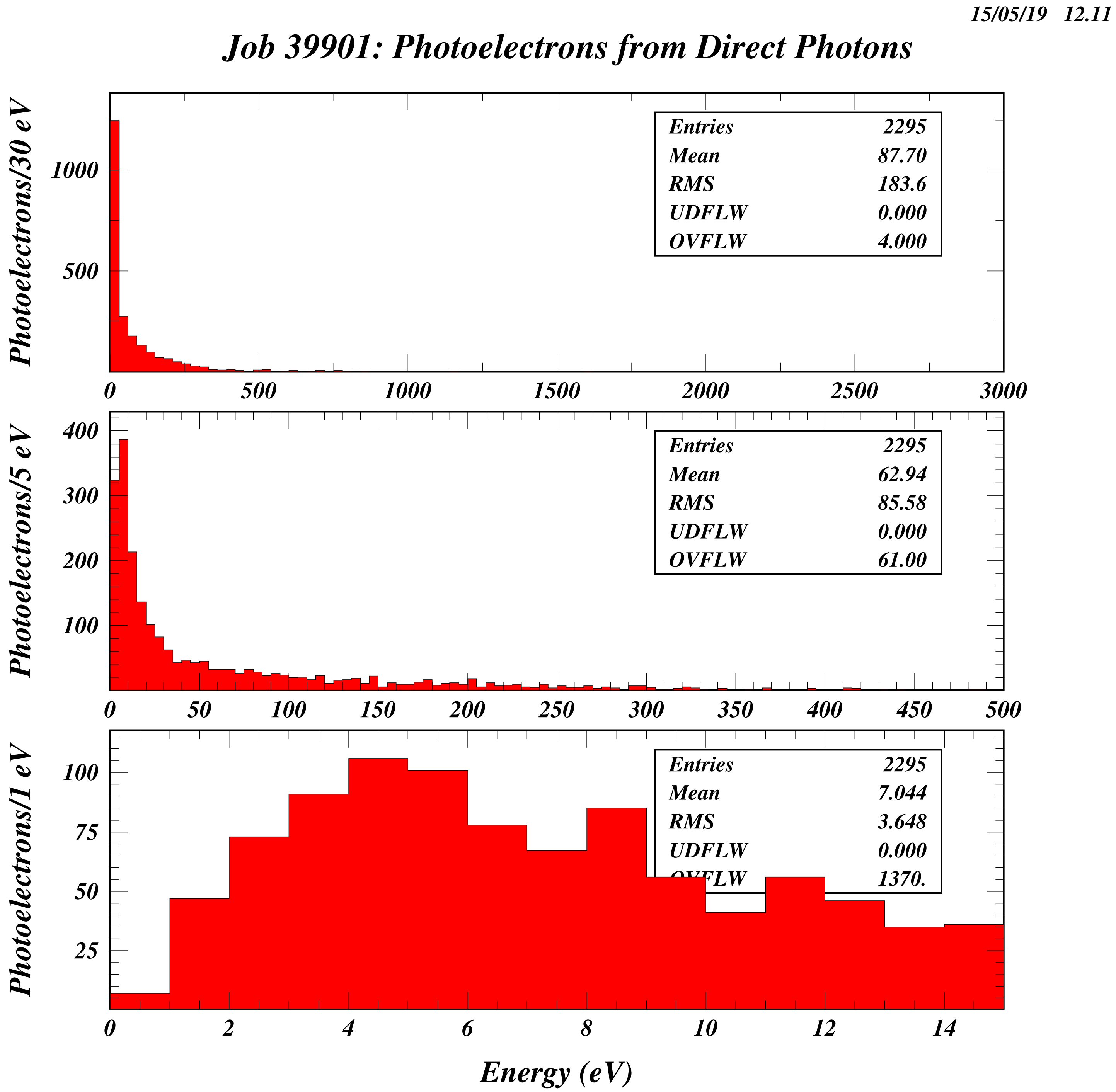
E_{kin}>50 eV: 765915 macroparticles, 3.67992e+10 e-

15/05/19 12.11

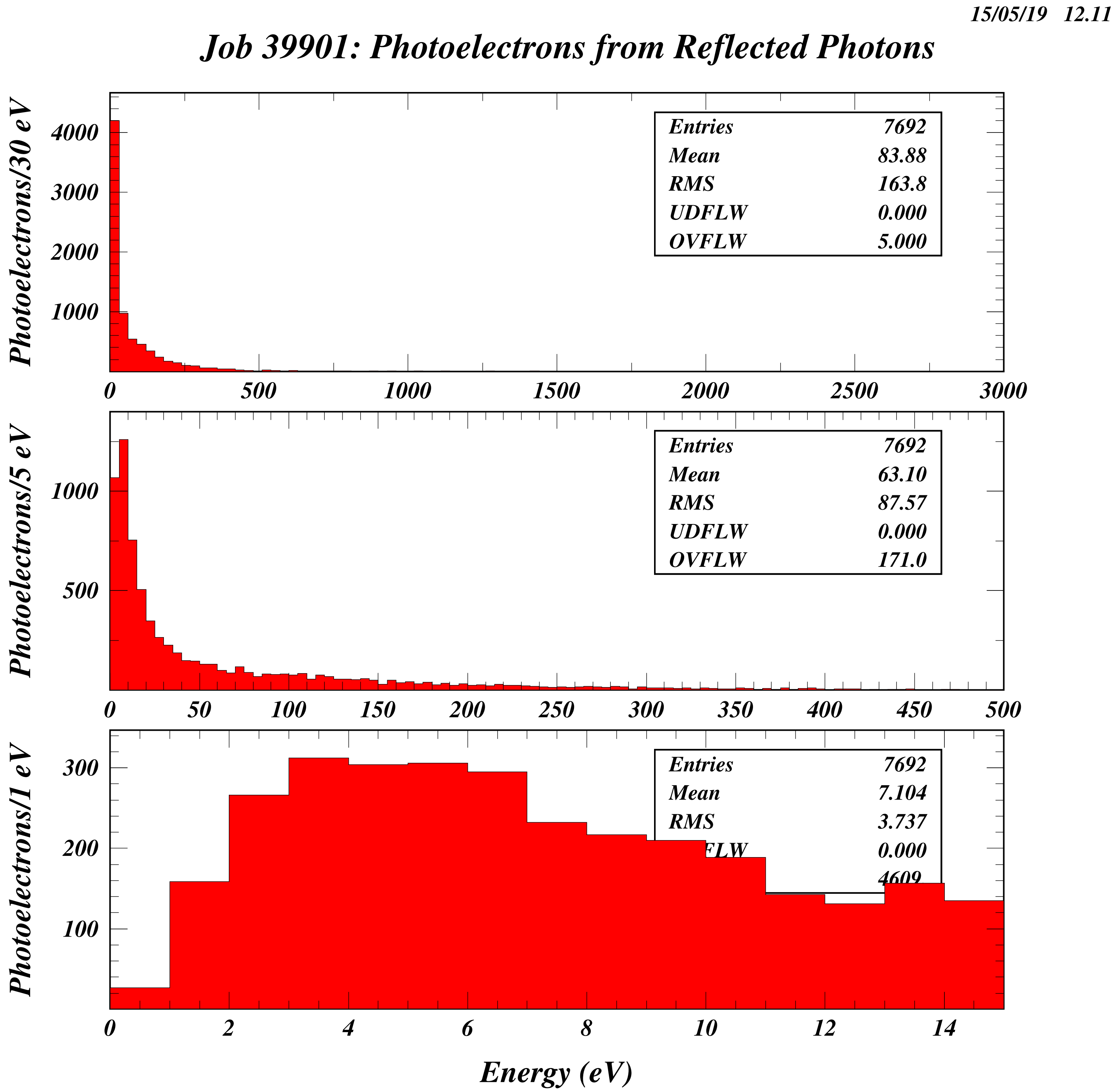


Job 39901: Time-Integrated Energies of Electrons Hitting Wall
Entries 501
Mean 15.66
RMS 32.69
Normalized Nr of Electrons per 1.6 eV
10^-1
10^-2
10^-3
10^-4
1
10
10^2
Percentage above energy cut (%)
60
50
40
30
20
10
0
1
10
10^2
Energy Cut (eV)


15/05/19 12.11
x 10 4
Job 39901: Time-Integrated Energies of Electrons Hitting Wall
Average current density hitting wall: -214748000 nA/cm2
Current Density (nA/cm2)
7000
6000
5000
4000
3000
2000
1000
0
0
1
2
3
4
5
6
Average power density hitting wall: 801133 W/m2
Power density (W/m2)
70000
60000
50000
40000
30000
20000
10000
0
Azimuth (radians)

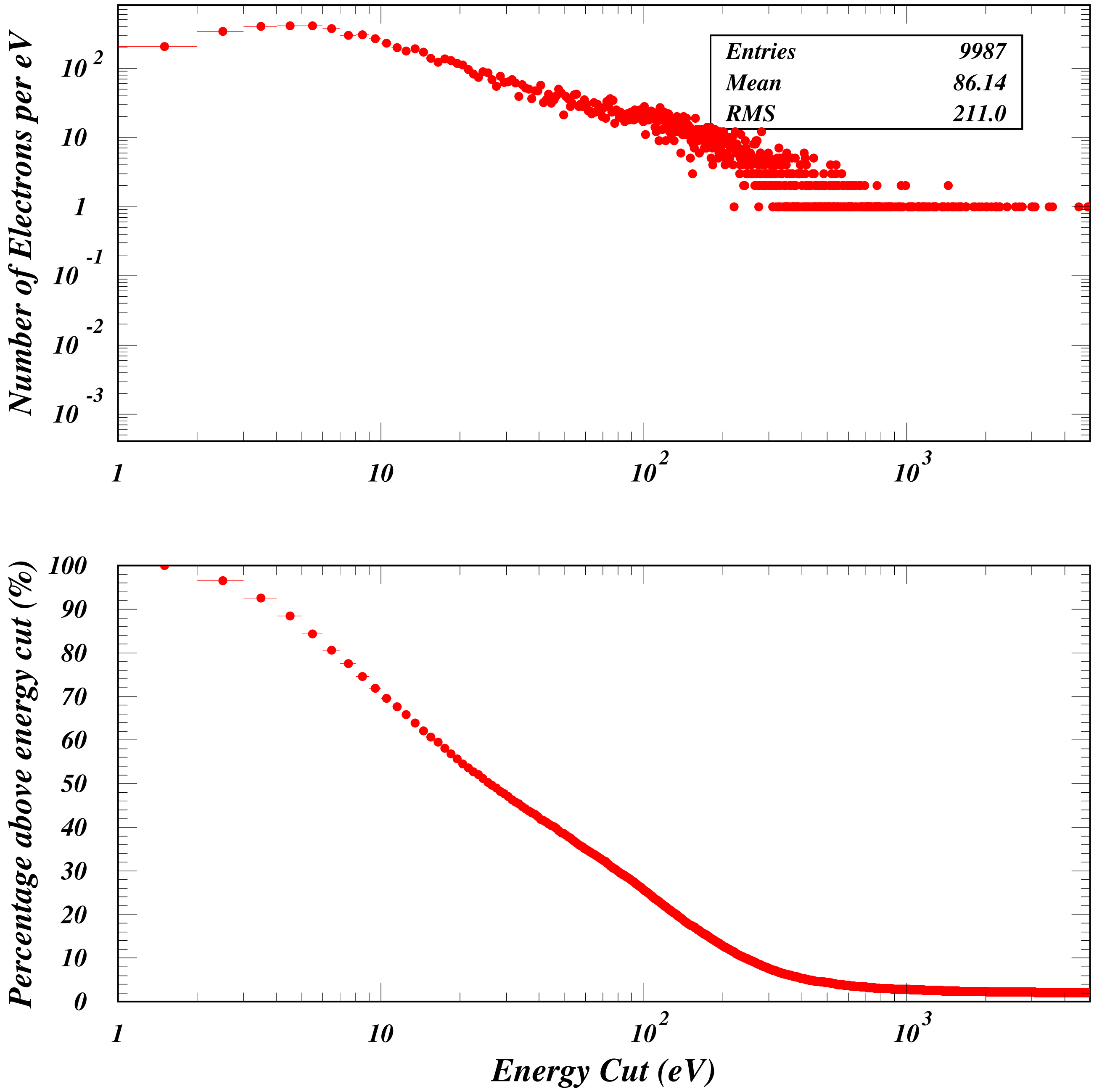


15/05/19 12.11
Job 39901: Photoelectrons from Direct Photons
Photoelectrons/30 eV
Entries 2295
Mean 87.70
RMS 183.6
UDFLW 0.000
OVFLW 4.000
Photoelectrons/5 eV
Entries 2295
Mean 62.94
RMS 85.58
UDFLW 0.000
OVFLW 61.00
Photoelectrons/1 eV
Entries 2295
Mean 7.044
RMS 3.648
UDFLW 0.000
1370.
Energy (eV)

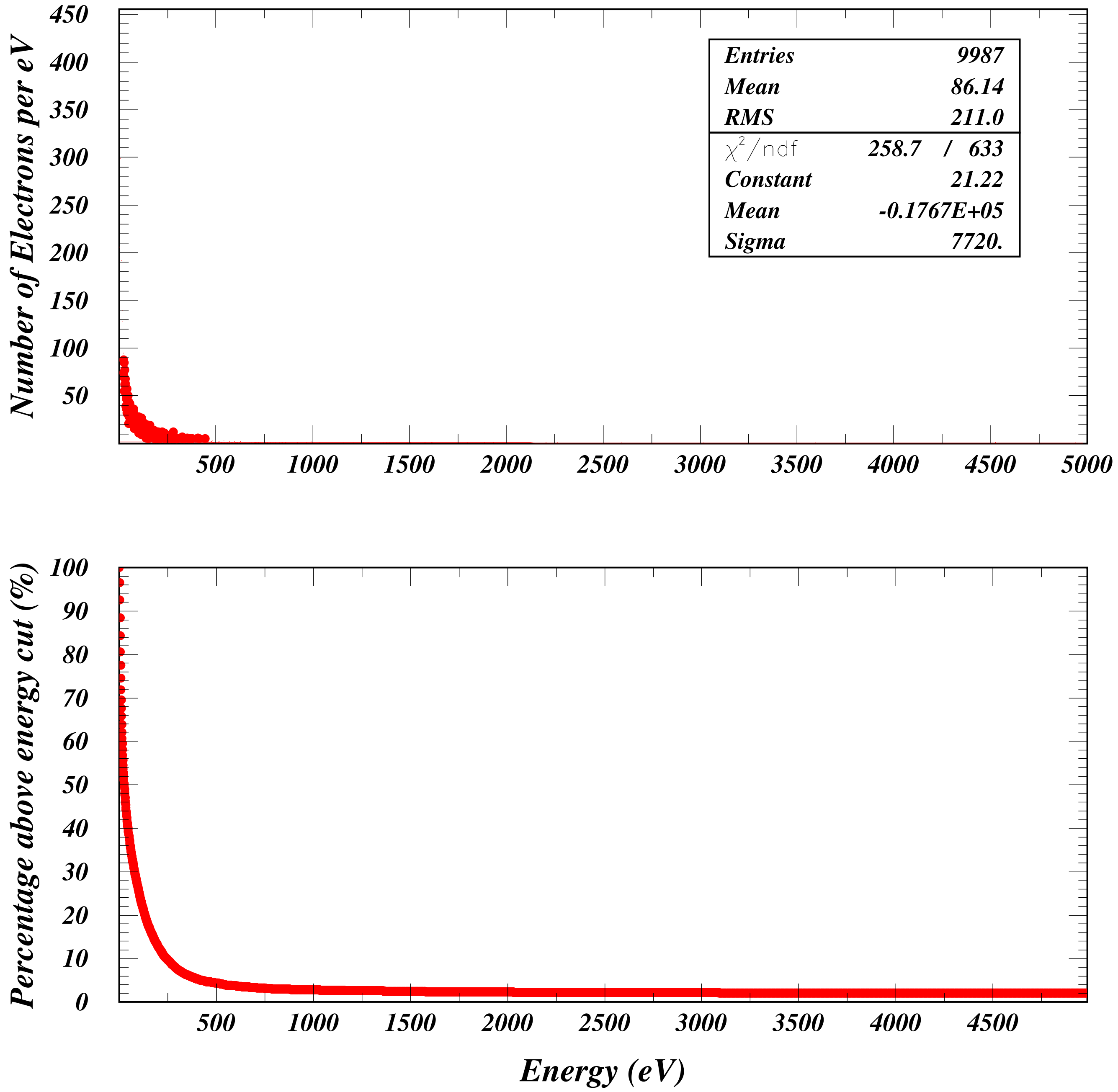

15/05/19 12.11
Job 39901: Photoelectrons from Reflected Photons
Photoelectrons/30 eV
Entries 7692
Mean 83.88
RMS 163.8
UDFLW 0.000
OVFLW 5.000
Photoelectrons/5 eV
Entries 7692
Mean 63.10
RMS 87.57
UDFLW 0.000
OVFLW 171.0
Photoelectrons/1 eV
Entries 7692
Mean 7.104
RMS 3.737
0.000
Energy (eV)

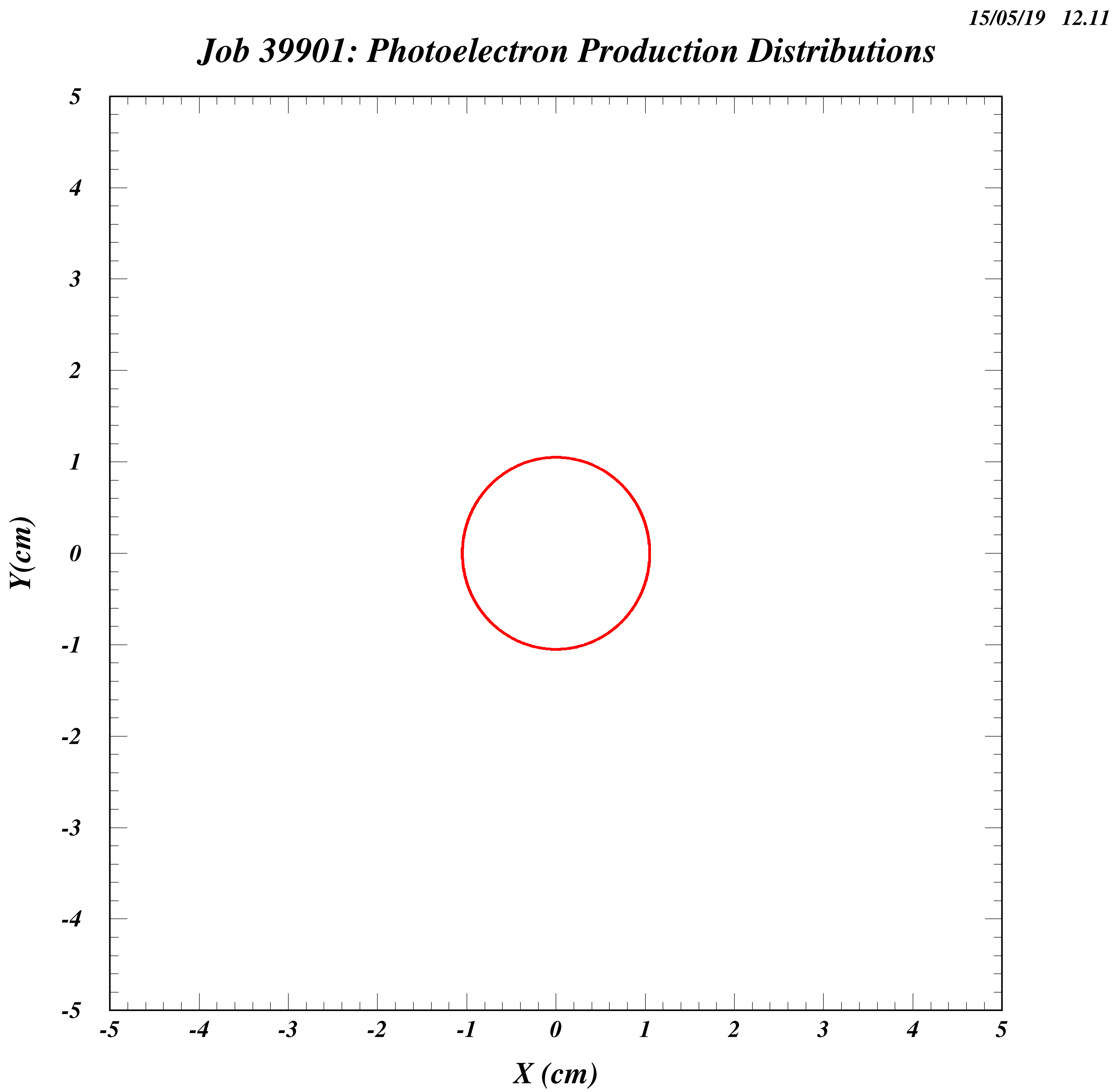
15/05/19 12.11

Job 39901: Photoelectron Energies



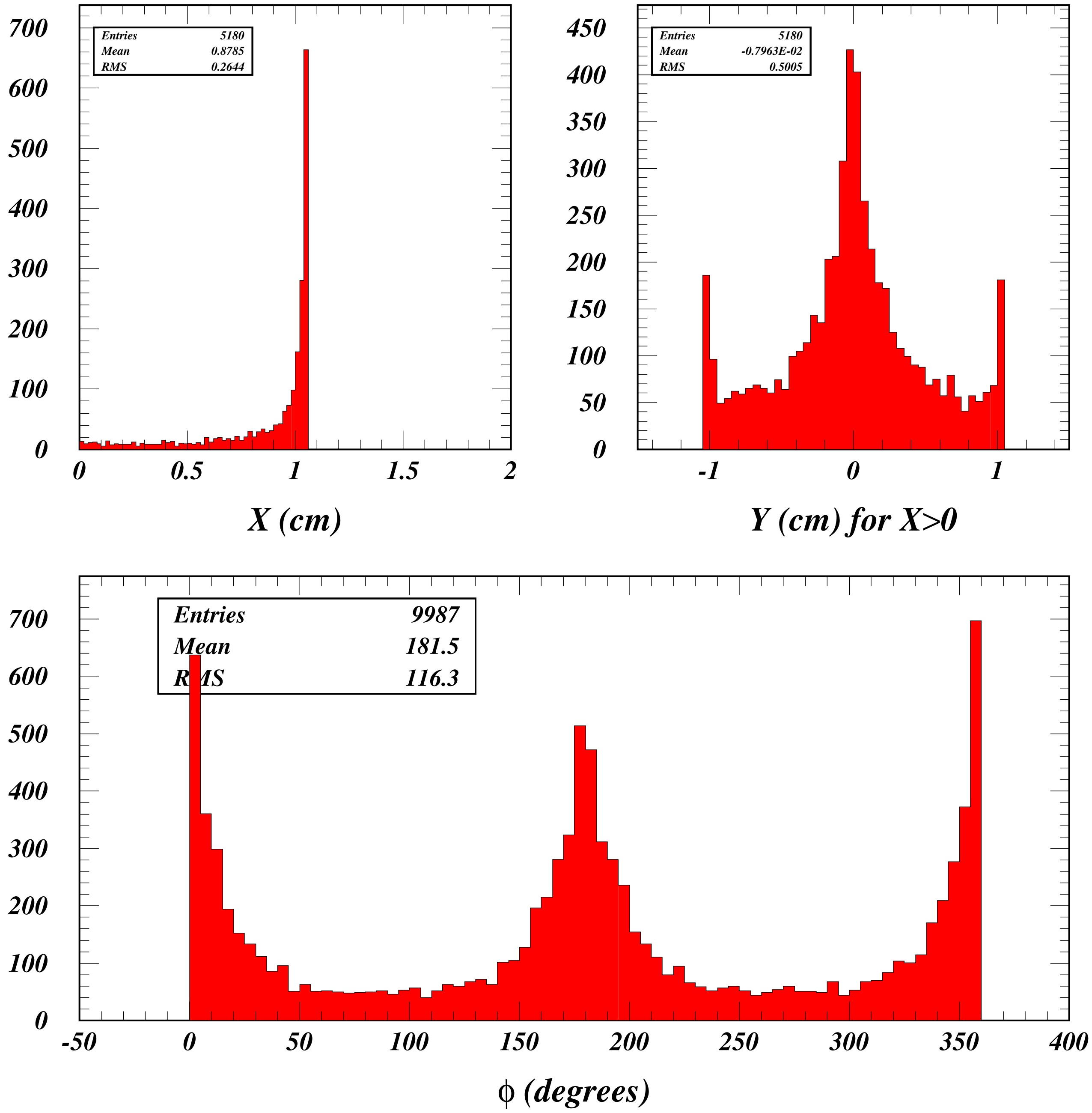
Job 39901: Photoelectron Energies



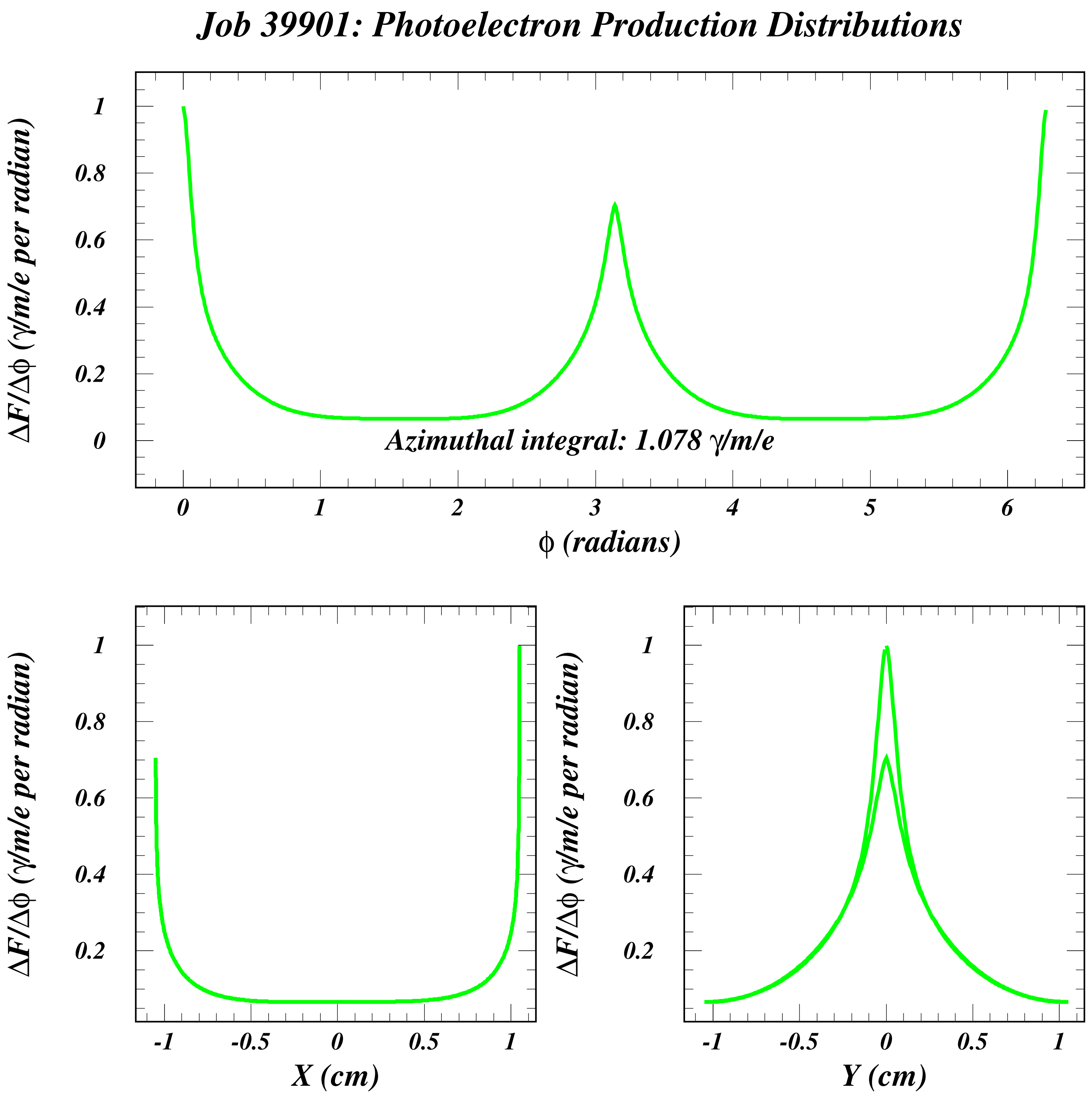

15/05/19 12.11
Job 39901: Photoelectron Production Distributions
Y(cm)
X (cm)
5
4
3
2
1
0
-1
-2
-3
-4
-5

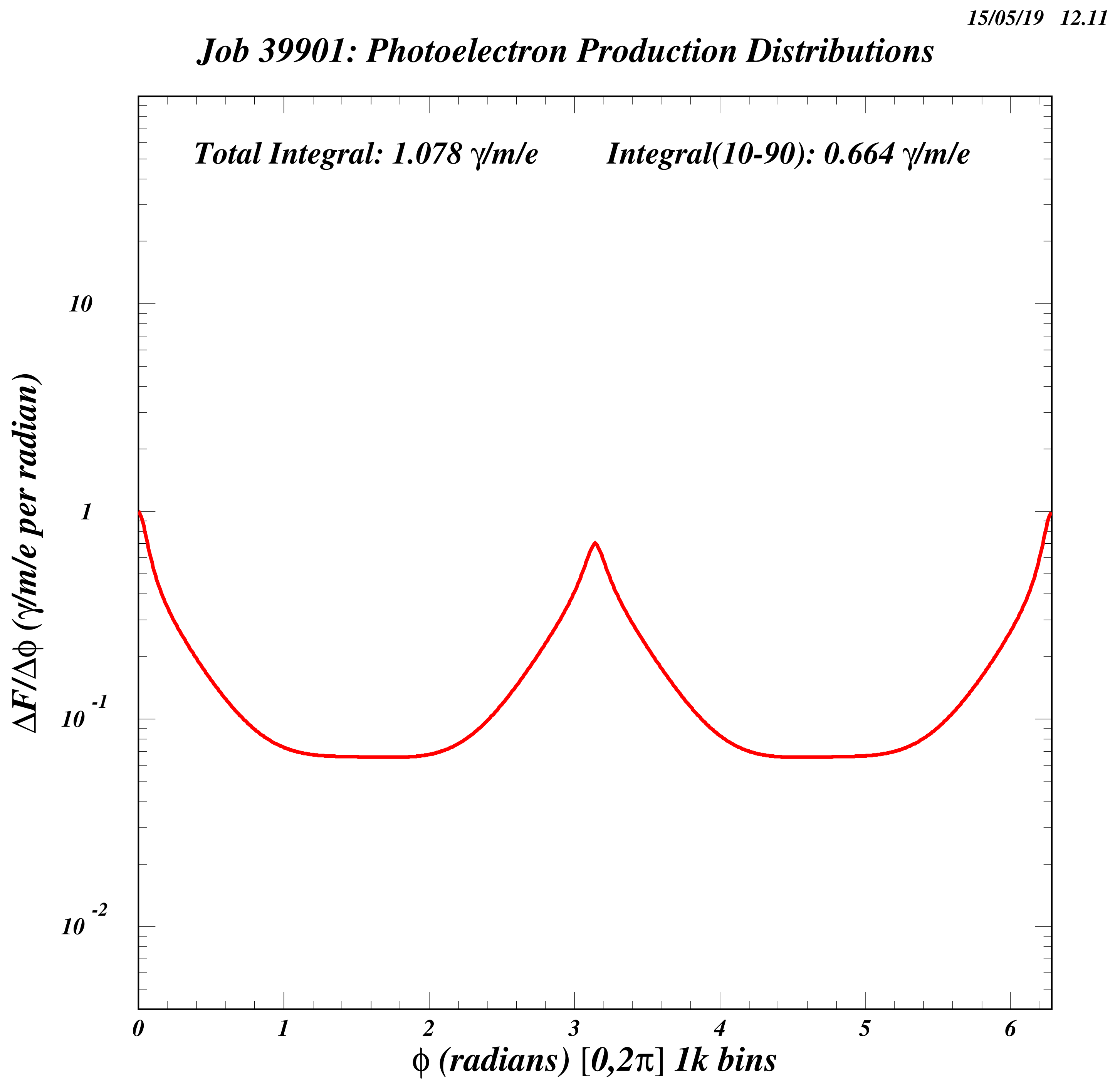
15/05/19   12.11

Job 39901: Photoelectron Production Distributions



15/05/19 12.11


Job 39901: Photoelectron Production Distributions
ΔF/Δφ (γ/m/e per radian)
Azimuthal integral: 1.078 γ/m/e
φ (radians)
ΔF/Δφ (γ/m/e per radian)
X (cm)
ΔF/Δφ (γ/m/e per radian)
Y (cm)


15/05/19 12.11
Job 39901: Photoelectron Production Distributions
Total Integral: 1.078 γ/m/e
Integral(10-90): 0.664 γ/m/e
10
1
10 -1
10 -2
ΔF/Δφ (γ/m/e per radian)
0
1
2
3
4
5
6
φ (radians) [0,2π] 1k bins