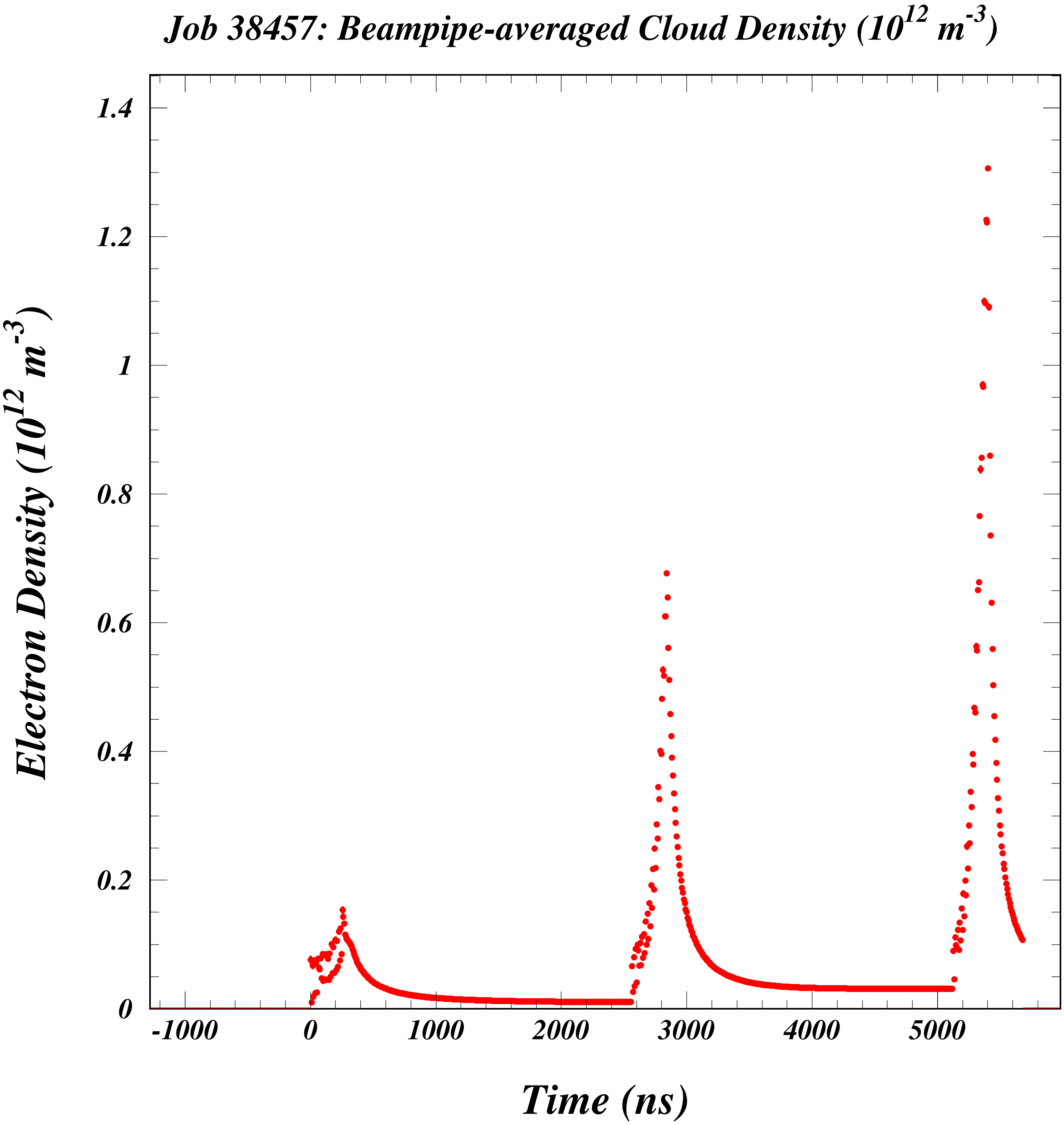
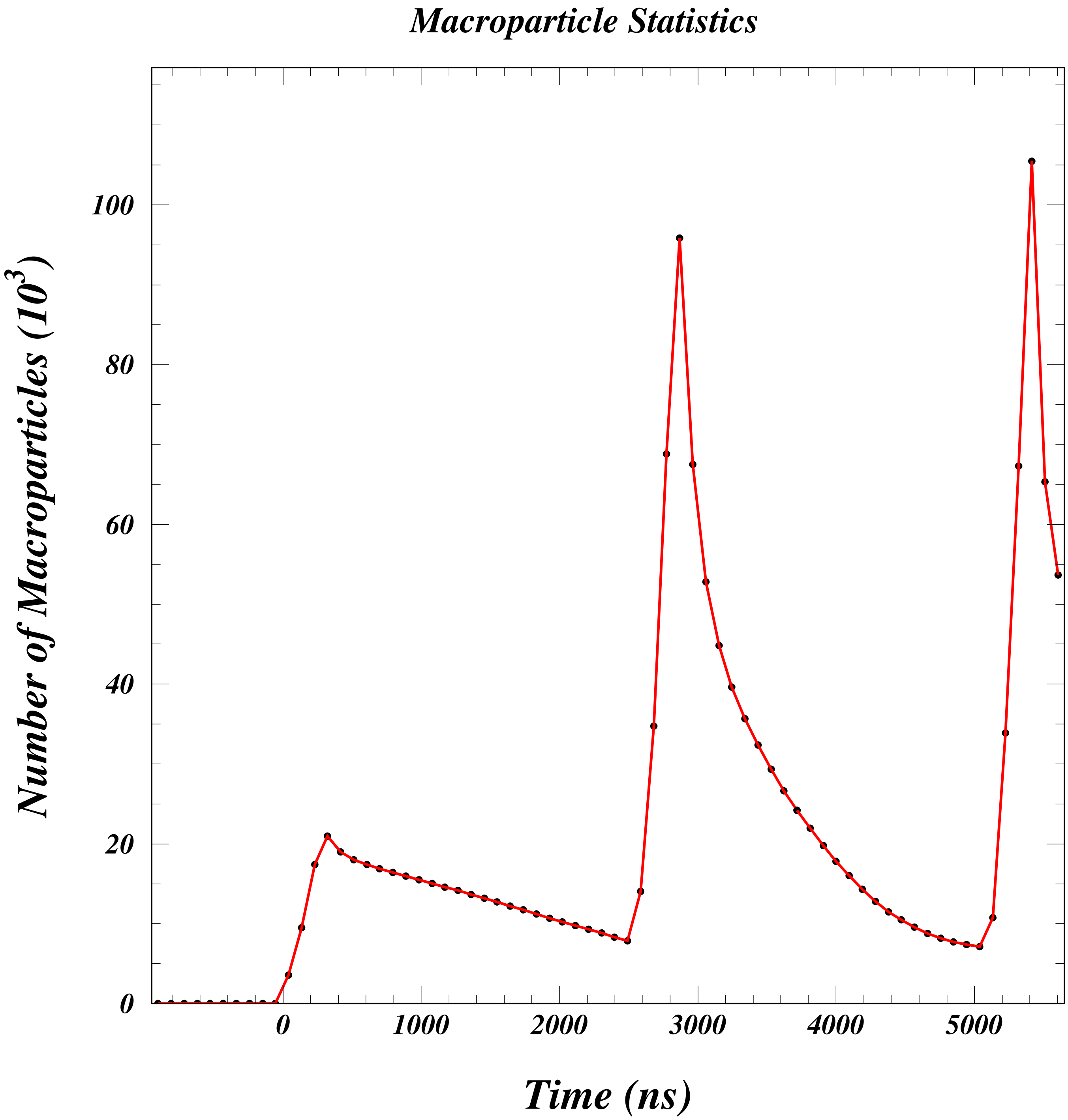
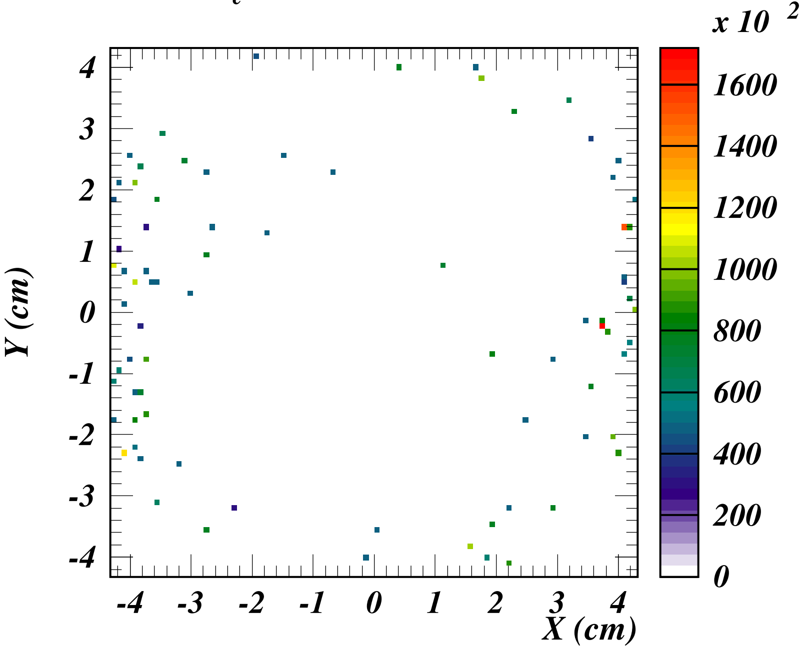

Job 38457: Beampipe-averaged Cloud Density (10^{12} m^{-3})
Electron Density (10^{12} m^{-3})
1.4
1.2
1
0.8
0.6
0.4
0.2
0
-1000
0
1000
2000
3000
4000
5000
Time (ns)

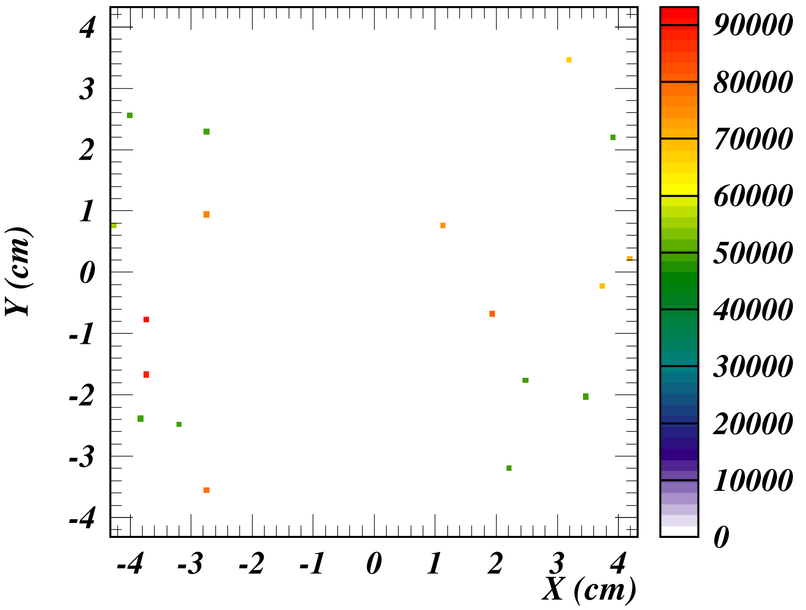

Macroparticle Statistics
Number of Macroparticles (10^3)
Time (ns)
0
20
40
60
80
100
0
1000
2000
3000
4000
5000

14/08/19 16.17

Cloud charge (N_e) snapshot after bunch 1 at time = 14 ns



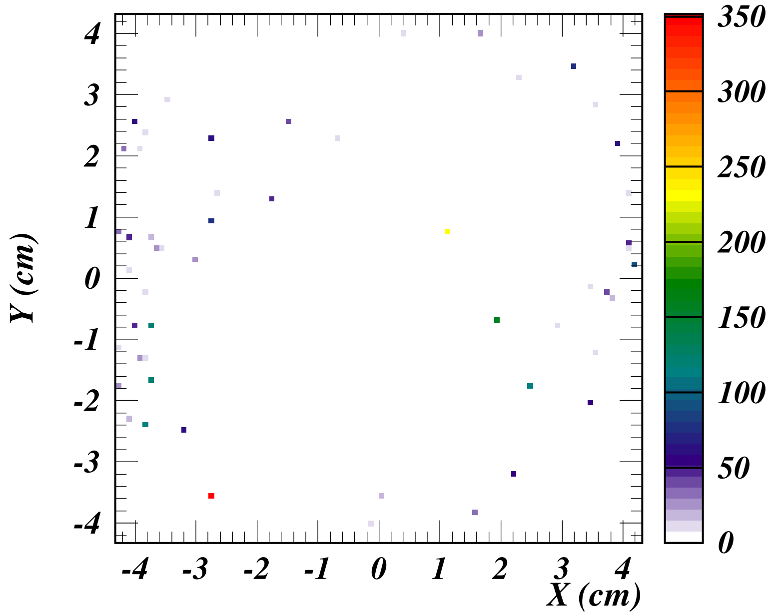
No energy cut: 798 macroparticles, 49853020 e-



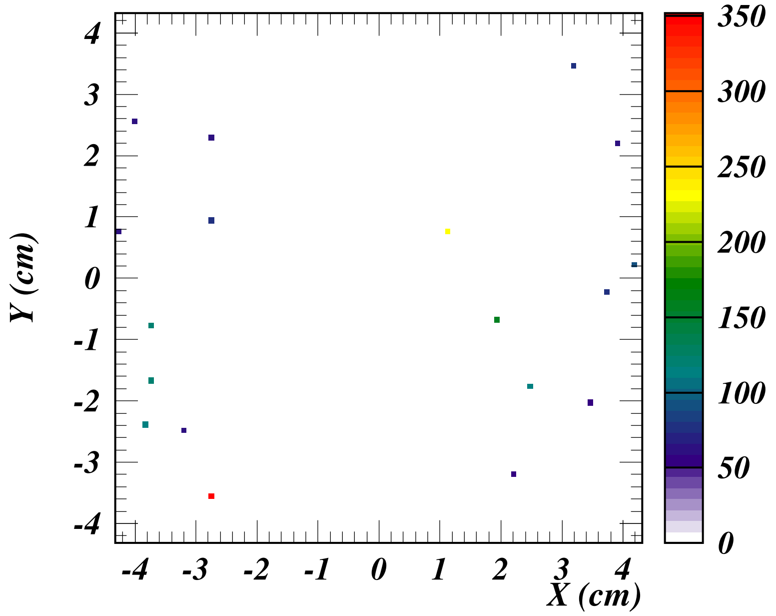
E_{kin}>50 eV: 20 macroparticles, 1285413 e-

14/08/19 16.17

Cloud energy (eV) snapshot after bunch 1 at time = 14 ns



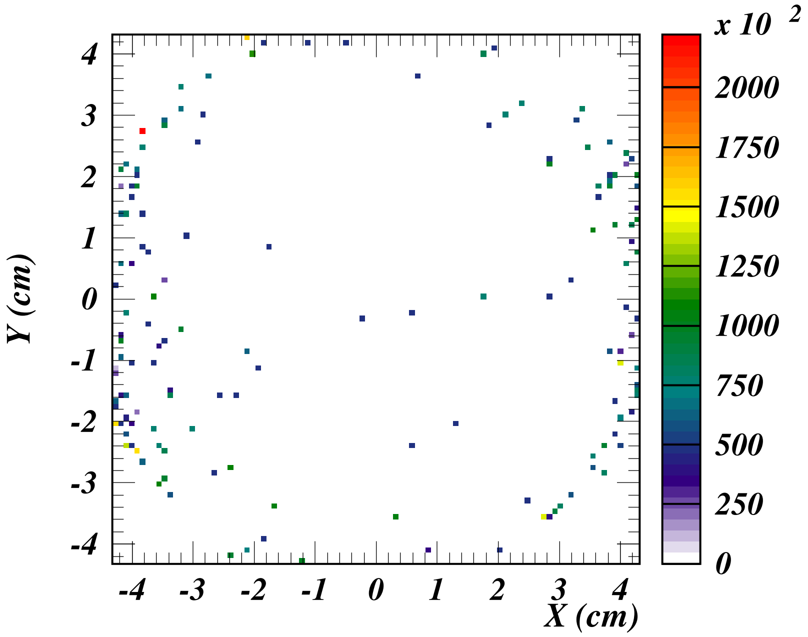
No energy cut: 798 macroparticles, 49853020 e-



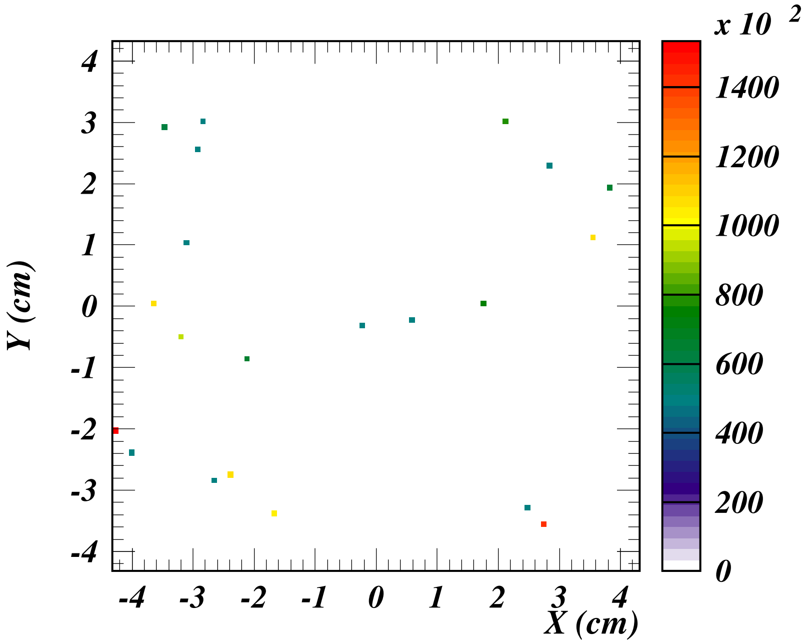
E_{kin}>50 eV: 20 macroparticles, 1285413 e-

14/08/19 16.17

Cloud charge (N_e) snapshot after bunch 2 at time = 28 ns

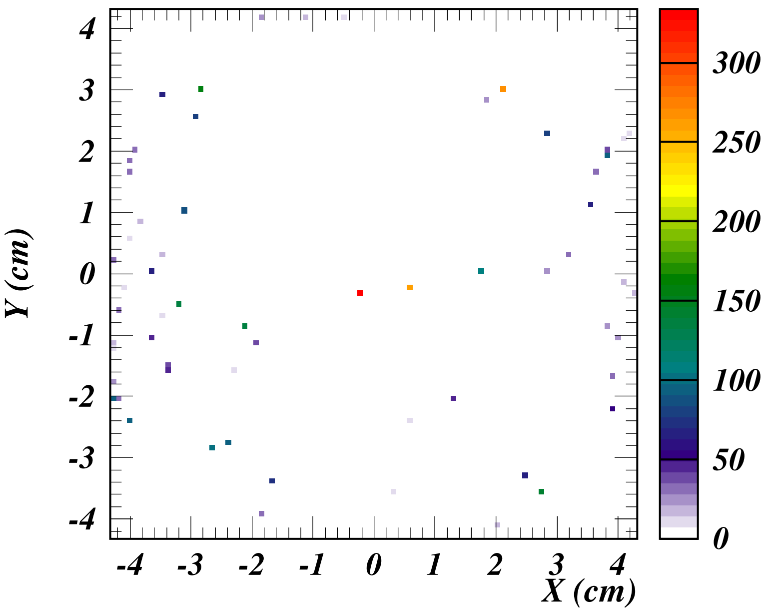


No energy cut: 2072 macroparticles, 102508576 e-

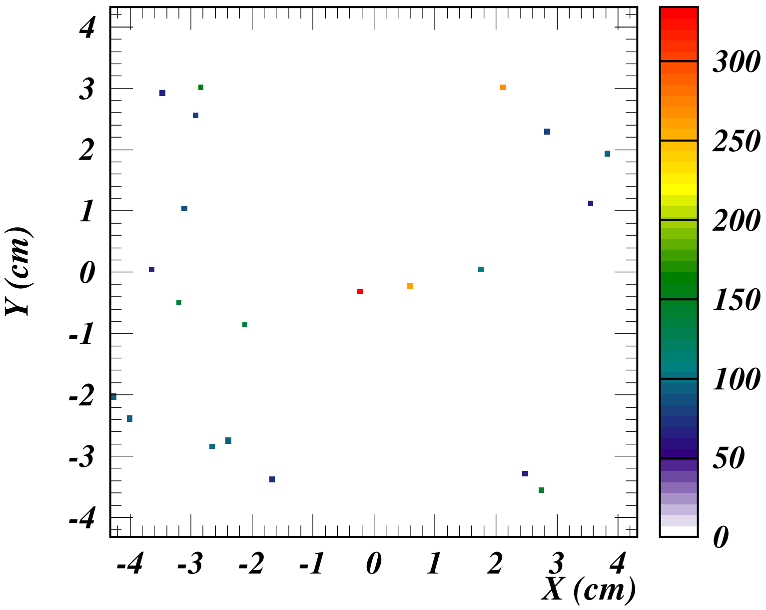


E_{kin}>50 eV: 26 macroparticles, 1948264 e-

Cloud energy (eV) snapshot after bunch 2 at time = 28 ns



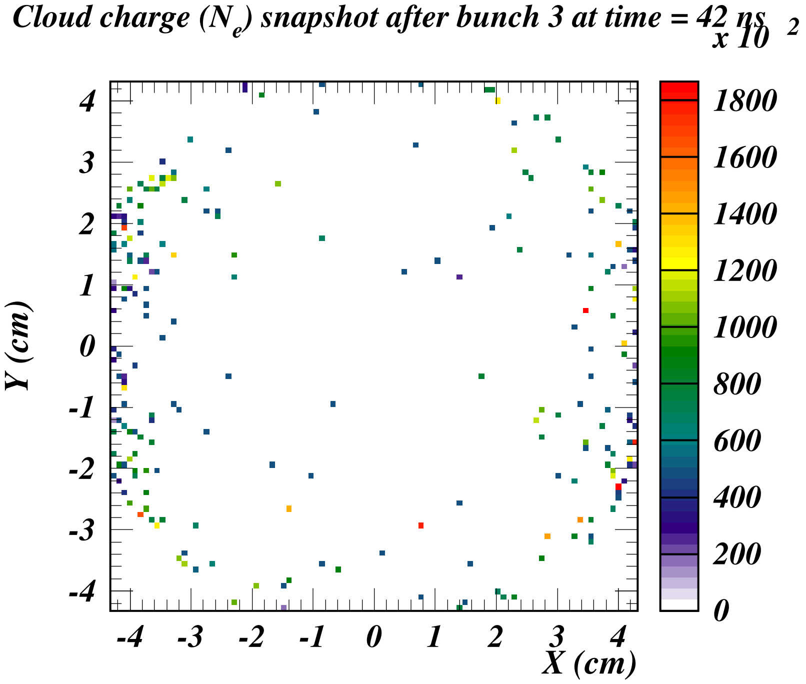
No energy cut: 2072 macroparticles, 102508576 e-



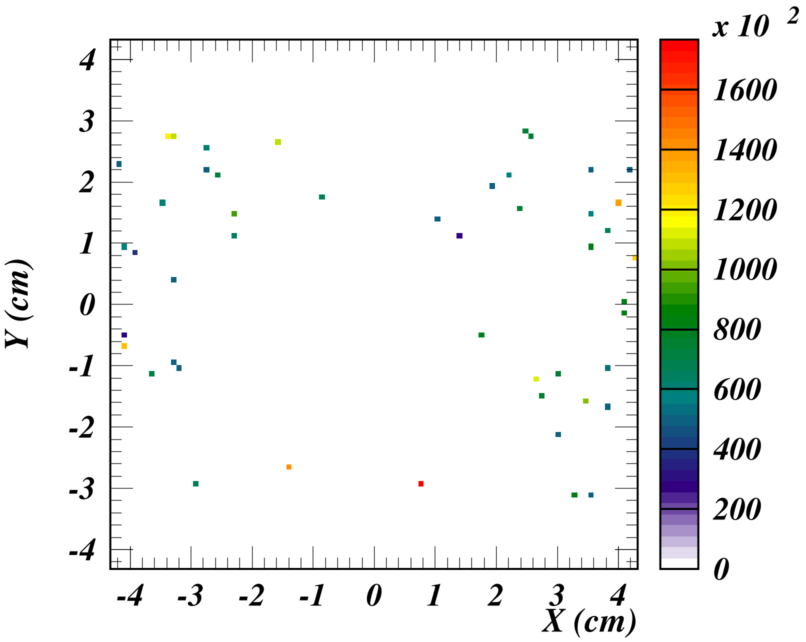
E_{kin}>50 eV: 26 macroparticles, 1948264 e-

14/08/19 16.17

Cloud charge (N_e) snapshot after bunch 3 at time = 42 ns



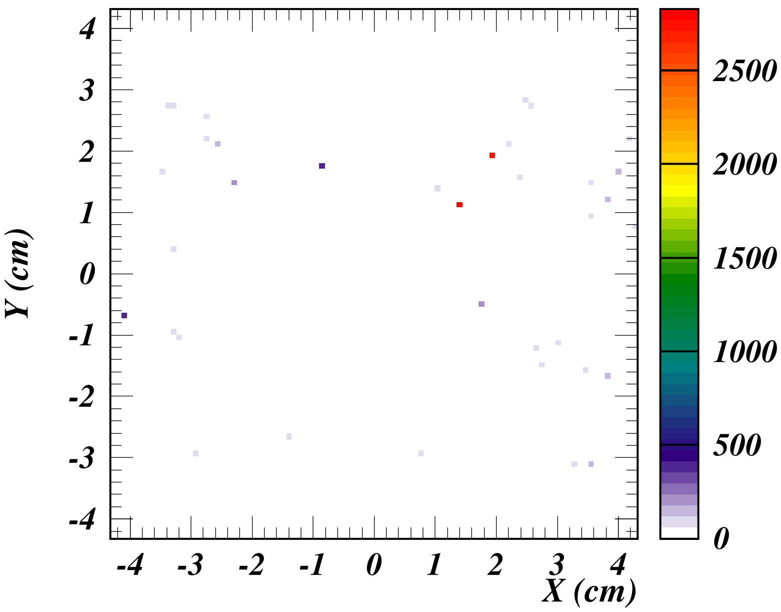
No energy cut: 3643 macroparticles, 120695664 e-



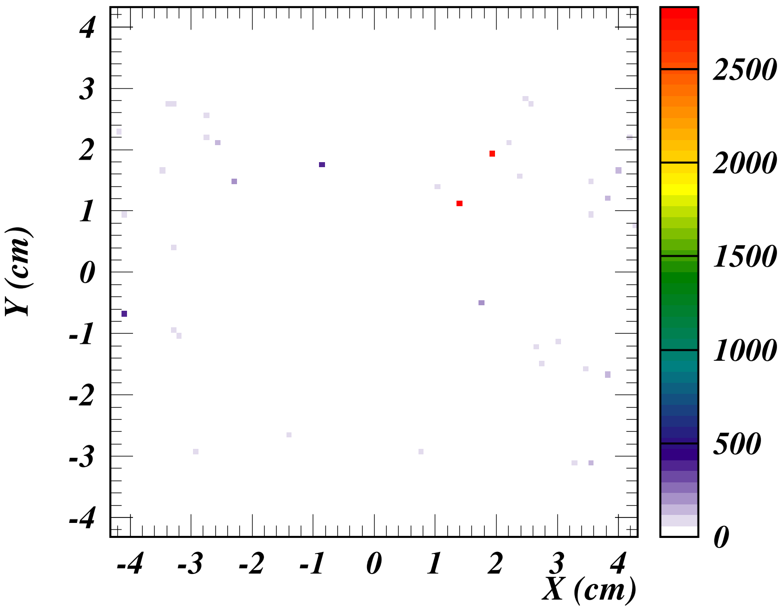
E_{kin}>50 eV: 54 macroparticles, 3740193 e-

14/08/19 16.17

Cloud energy (eV) snapshot after bunch 3 at time = 42 ns



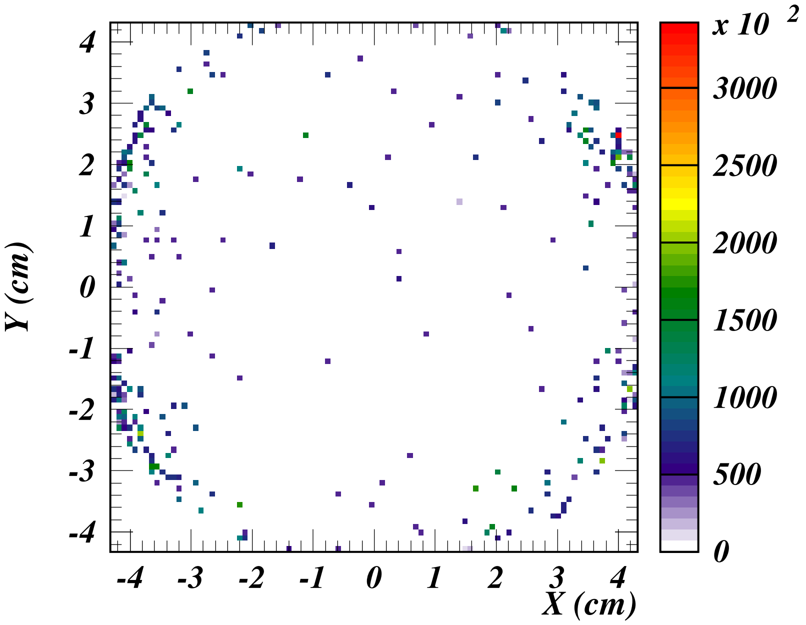
No energy cut: 3643 macroparticles, 120695664 e-



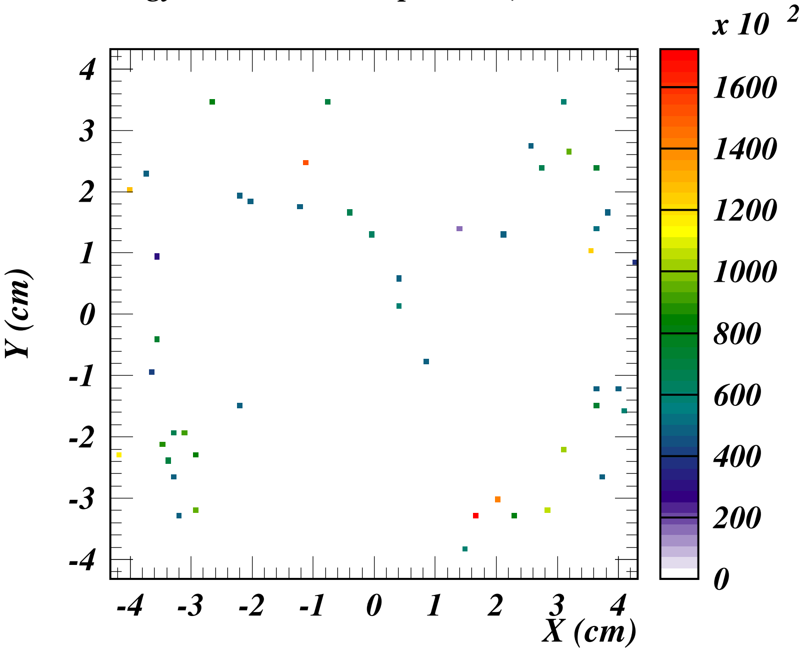
E_{kin}>50 eV: 54 macroparticles, 3740193 e-

14/08/19 16.17

Cloud charge (N_e) snapshot after bunch 4 at time = 56 ns



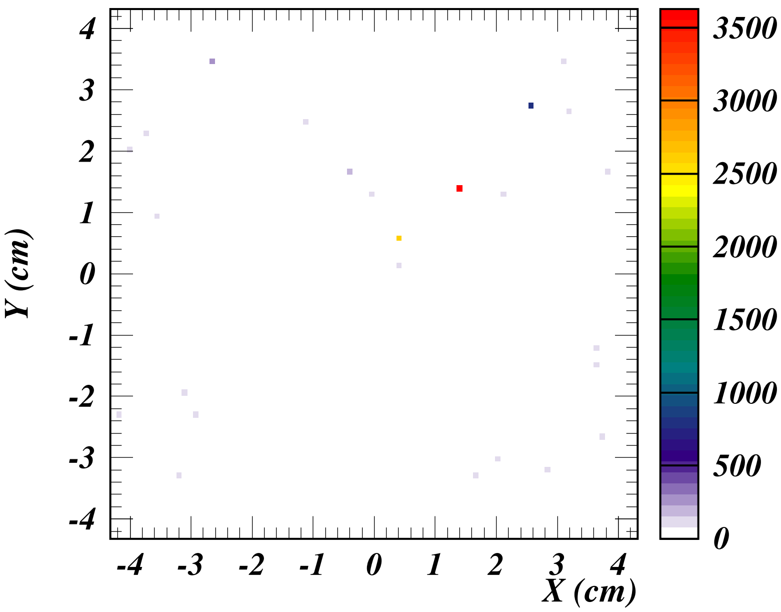
No energy cut: 4491 macroparticles, 139906976 e-



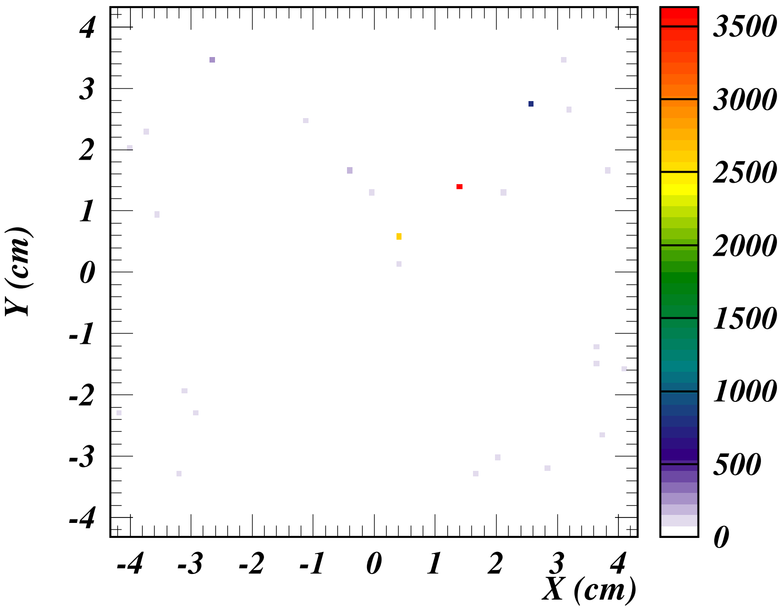
E_{kin}>50 eV: 62 macroparticles, 3769459 e-

14/08/19 16.17

Cloud energy (eV) snapshot after bunch 4 at time = 56 ns



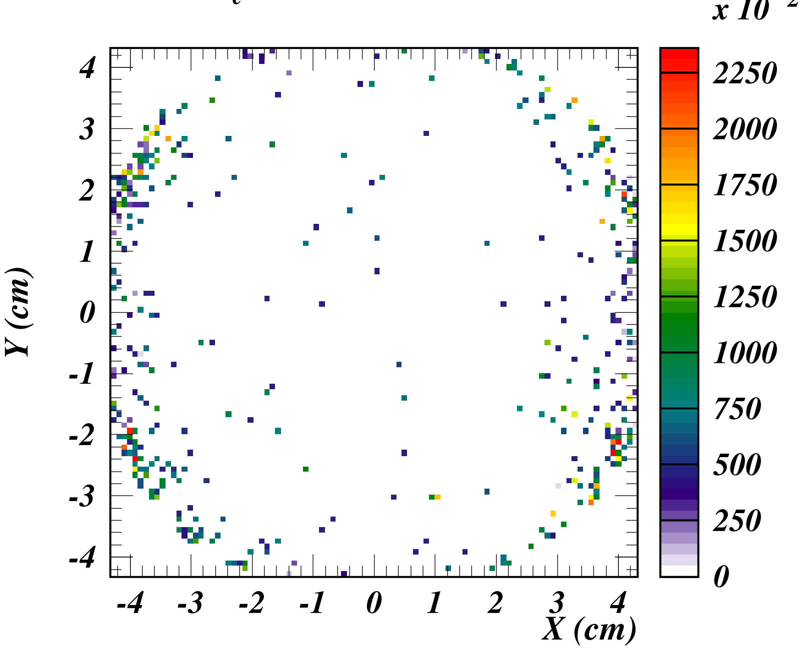
No energy cut: 4491 macroparticles, 139906976 e-



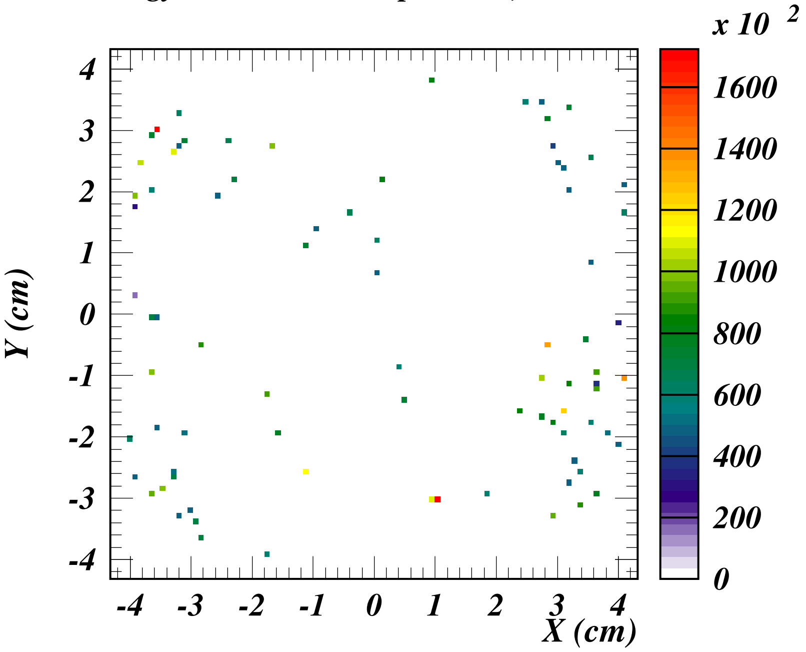
E_{kin}>50 eV: 62 macroparticles, 3769459 e-

14/08/19 16.17

Cloud charge (N_e) snapshot after bunch 5 at time = 70 ns



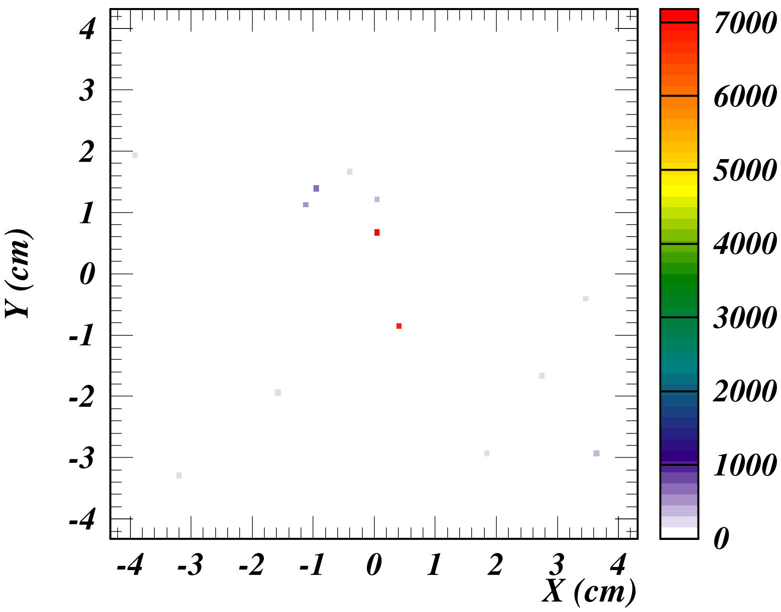
No energy cut: 5197 macroparticles, 153171232 e-



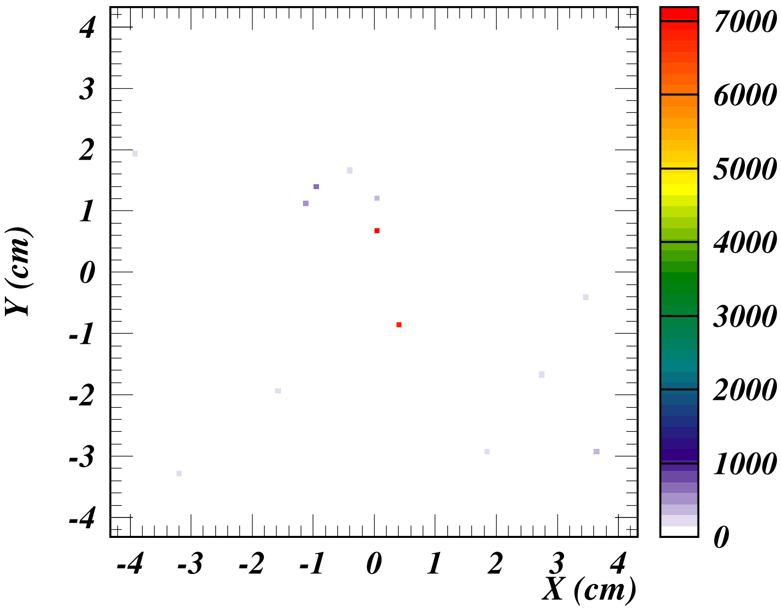
E_{kin}>50 eV: 110 macroparticles, 6118566 e-

14/08/19 16.17

Cloud energy (eV) snapshot after bunch 5 at time = 70 ns



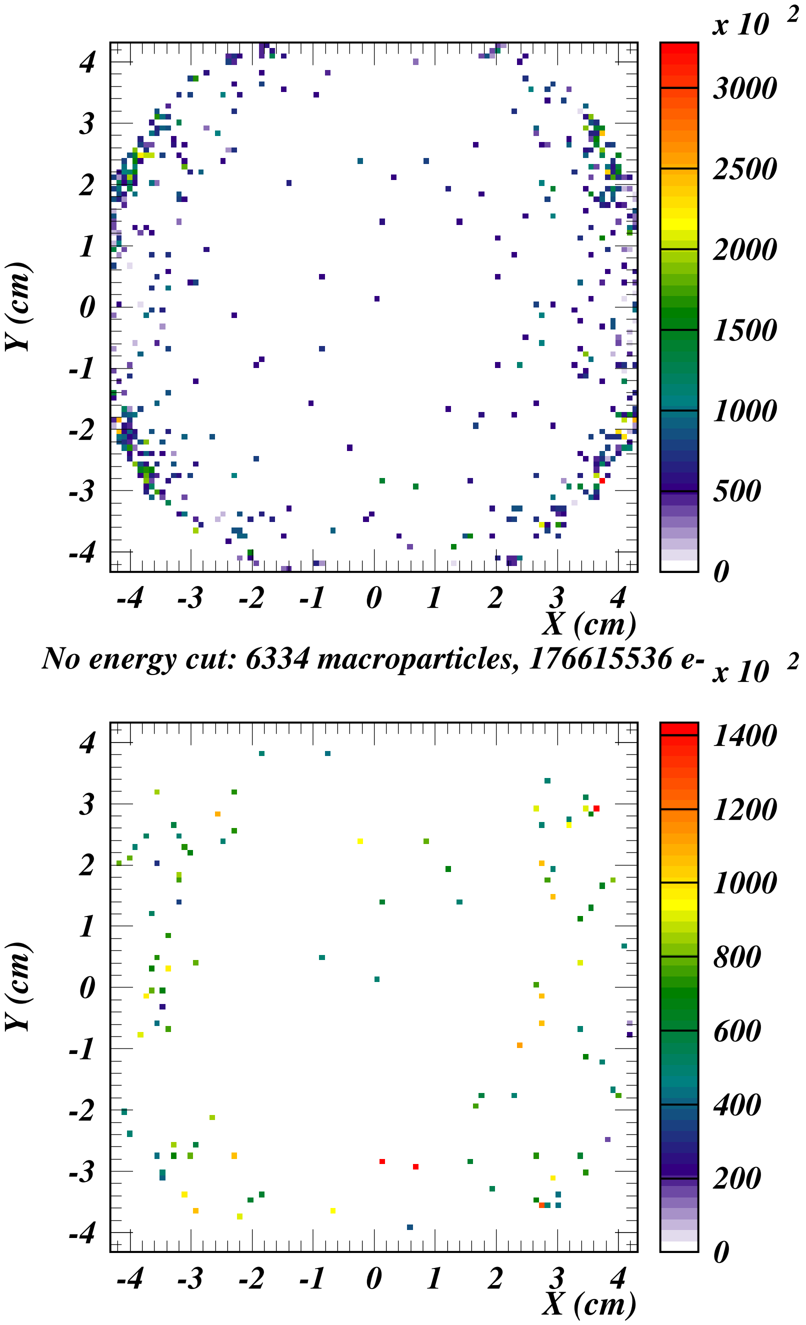
No energy cut: 5197 macroparticles, 153171232 e-



E_{kin}>50 eV: 110 macroparticles, 6118566 e-

14/08/19 16.17

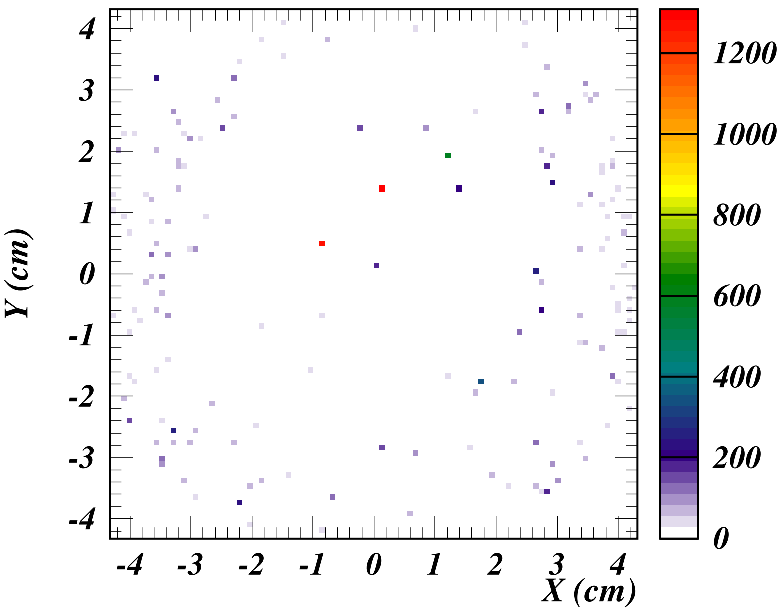
Cloud charge (N_e) snapshot after bunch 6 at time = 84 ns



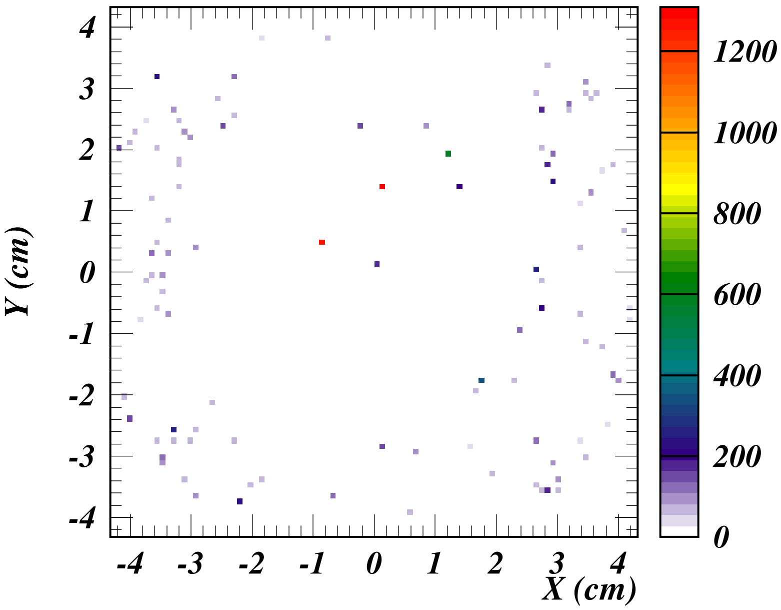
E_{kin}>50 eV: 133 macroparticles, 7.39127e+06 e-

14/08/19 16.17

Cloud energy (eV) snapshot after bunch 6 at time = 84 ns



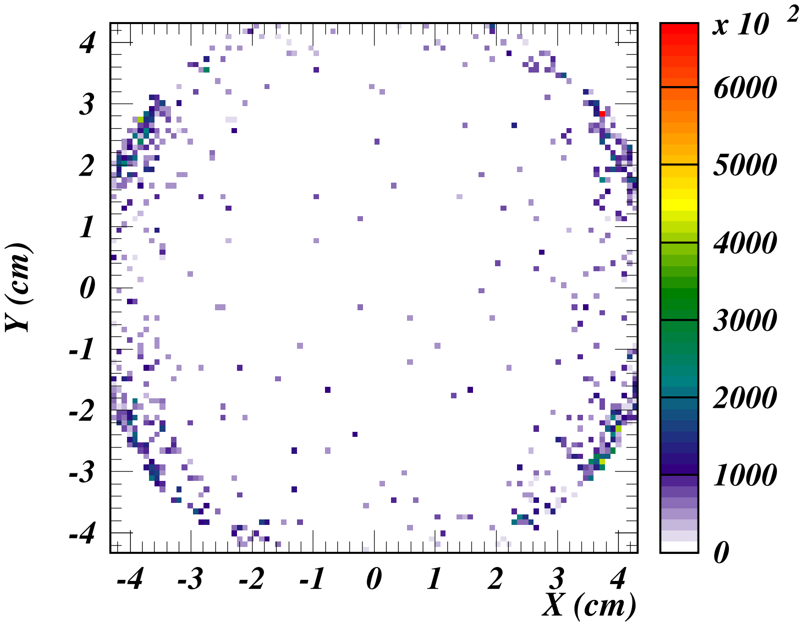
No energy cut: 6334 macroparticles, 176615536 e-



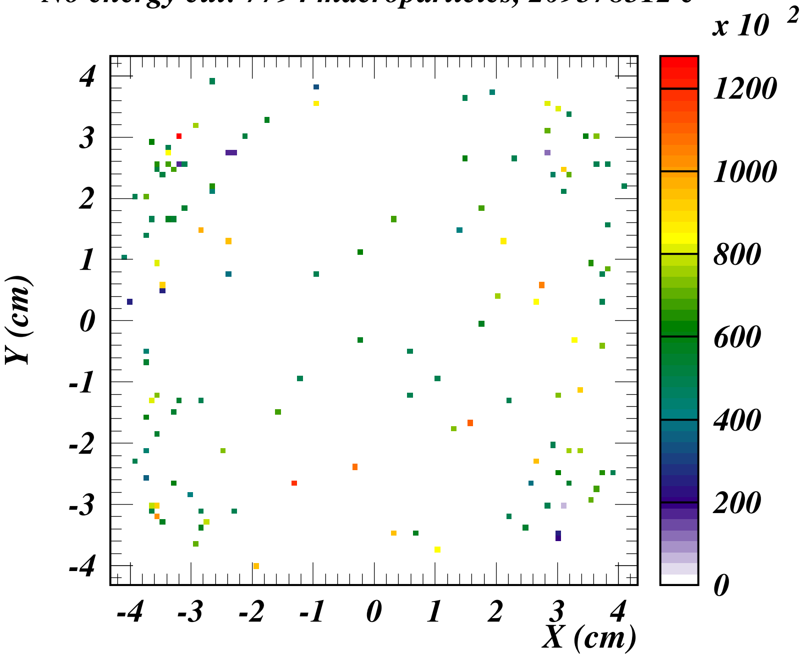
E_{kin}>50 eV: 133 macroparticles, 7.39127e+06 e-

14/08/19 16.17

Cloud charge (N_e) snapshot after bunch 7 at time = 98 ns



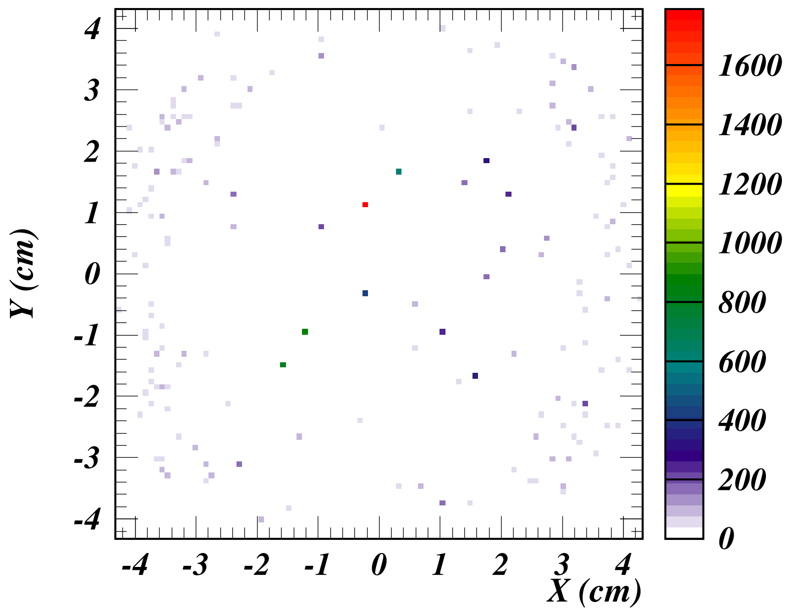
No energy cut: 7794 macroparticles, 209378512 e-



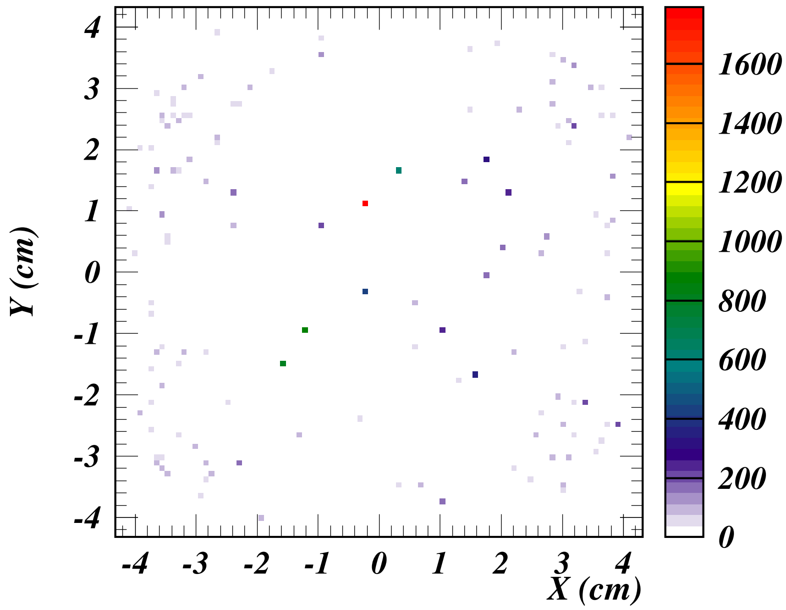
E_{kin}>50 eV: 162 macroparticles, 8.14712e+06 e-

14/08/19 16.17

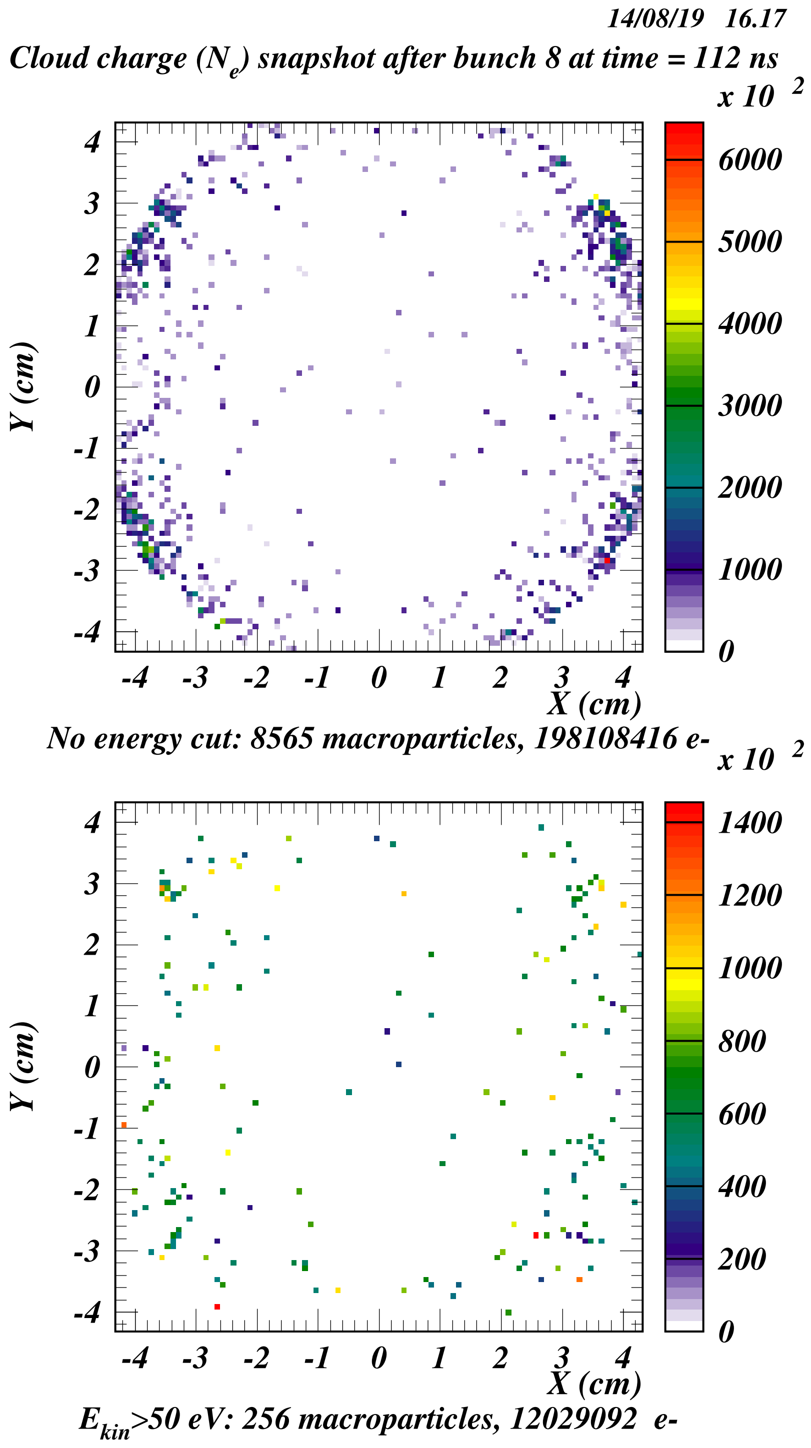
Cloud energy (eV) snapshot after bunch 7 at time = 98 ns



No energy cut: 7794 macroparticles, 209378512 e-



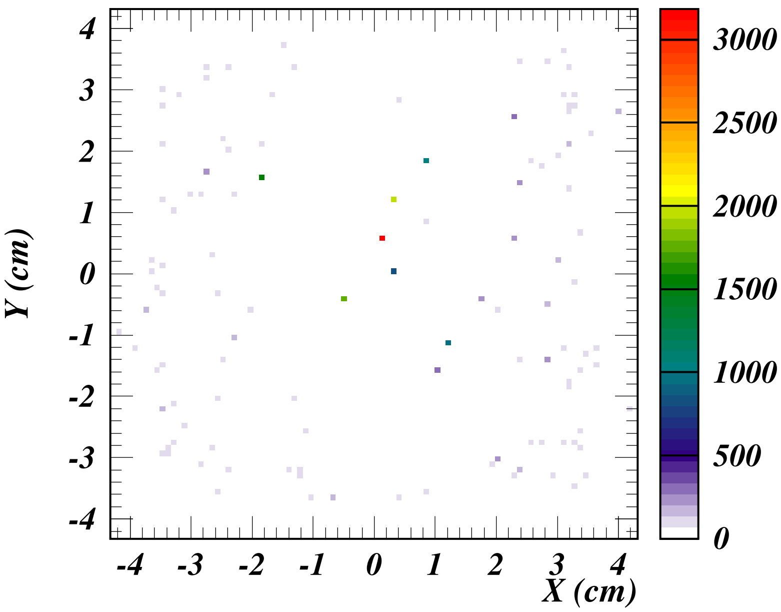
E_{kin}>50 eV: 162 macroparticles, 8.14712e+06 e-



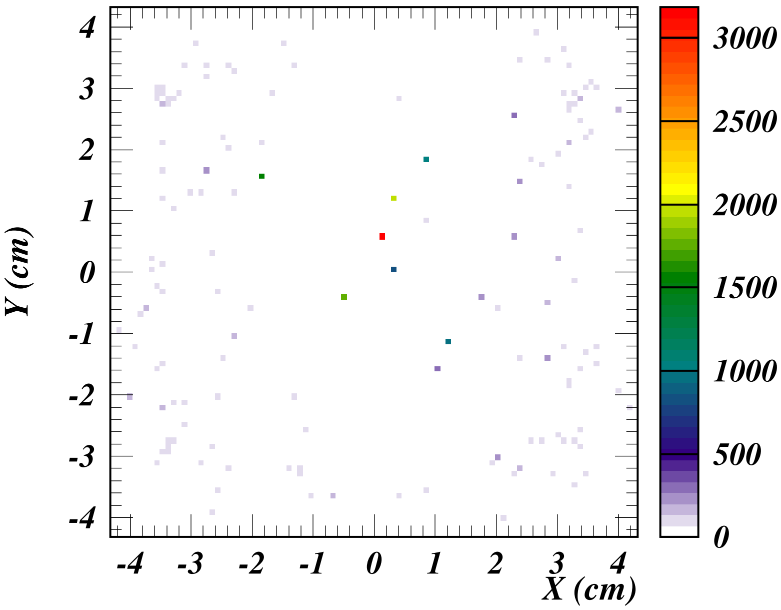
14/08/19 16.17
Cloud charge (N_e) snapshot after bunch 8 at time = 112 ns
x 10 ^{2}
6000
5000
4000
3000
2000
1000
0
Y (cm)
X (cm)
No energy cut: 8565 macroparticles, 198108416 e-
x 10 ^{2}
1400
1200
1000
800
600
400
200
0
Y (cm)
X (cm)
E_{kin}>50 eV: 256 macroparticles, 12029092 e-

14/08/19 16.17

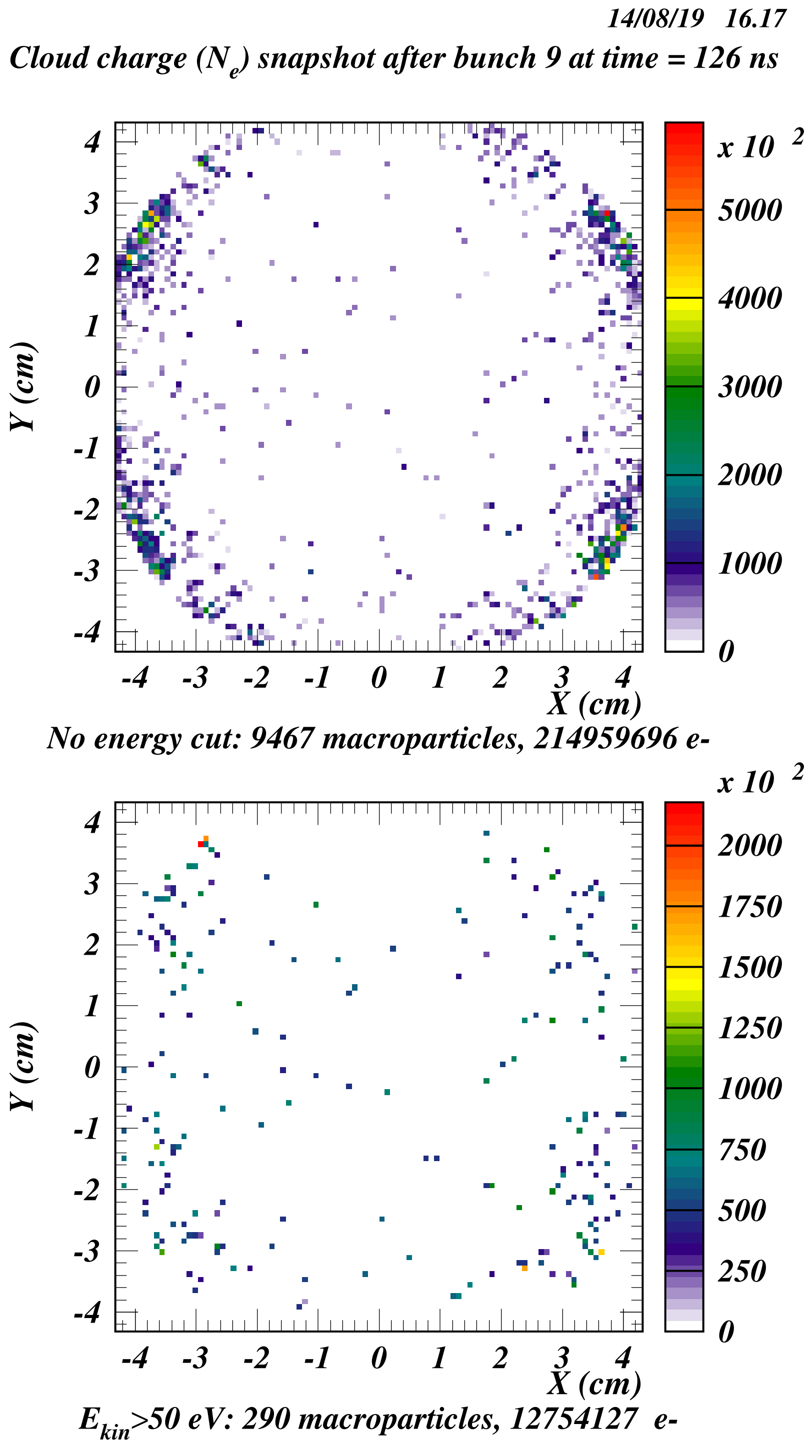
Cloud energy (eV) snapshot after bunch 8 at time = 112 ns



No energy cut: 8565 macroparticles, 198108416 e-

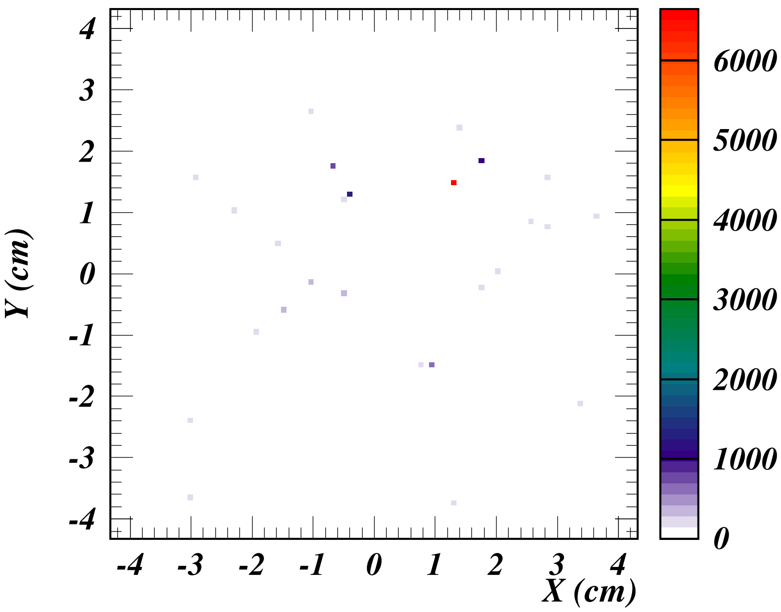


E_{kin}>50 eV: 256 macroparticles, 12029092 e-

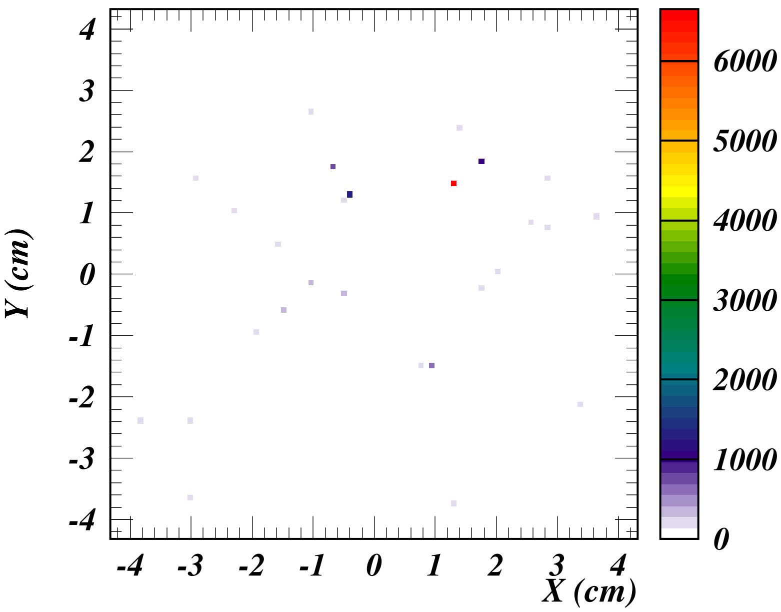

14/08/19 16.17
Cloud charge (N_e) snapshot after bunch 9 at time = 126 ns
Y (cm)
X (cm)
x 10 2
5000
4000
3000
2000
1000
0
No energy cut: 9467 macroparticles, 214959696 e-
Y (cm)
X (cm)
x 10 2
2000
1750
1500
1250
1000
750
500
250
0
E_{kin}>50 eV: 290 macroparticles, 12754127 e-

14/08/19 16.17

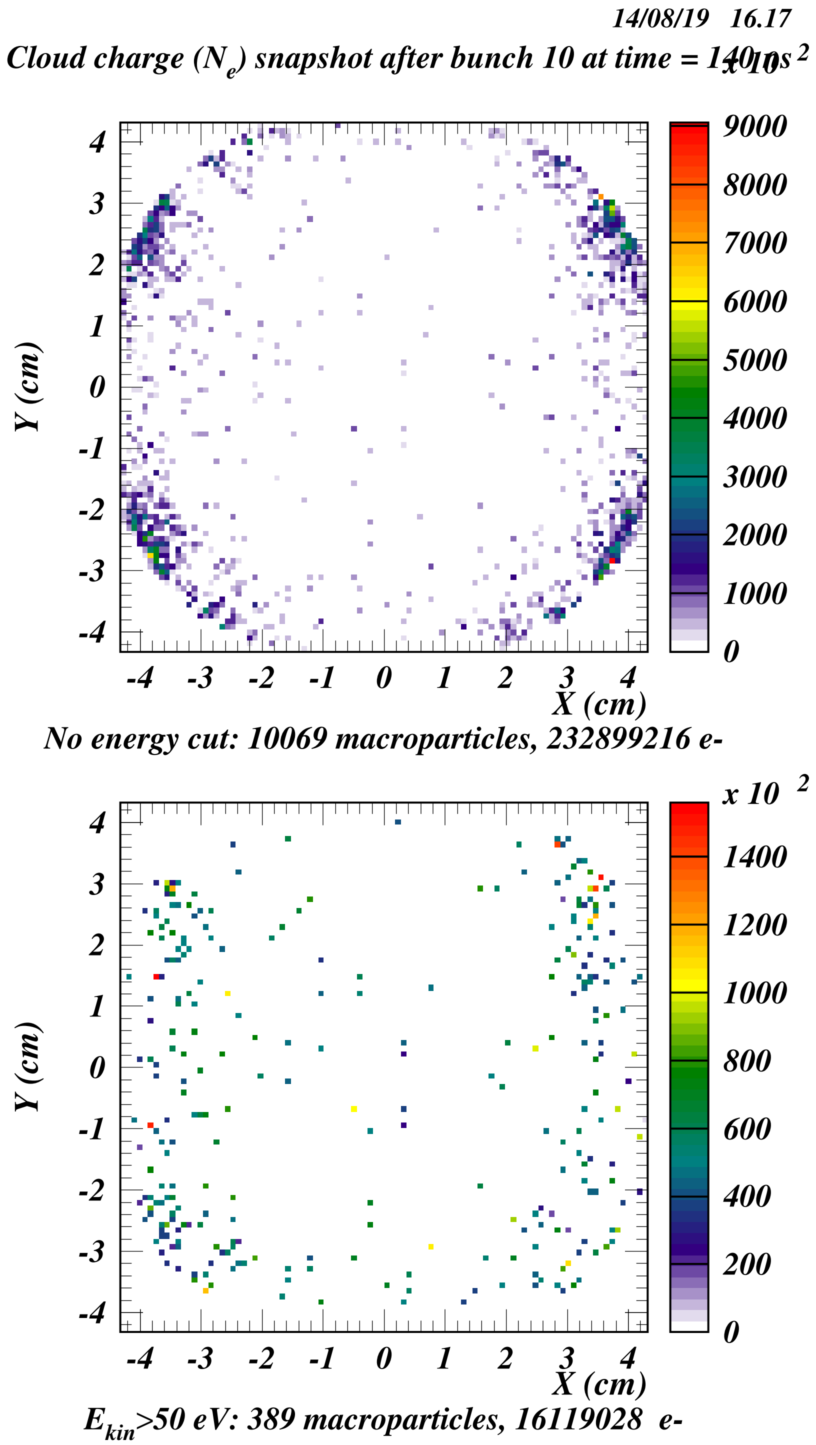
Cloud energy (eV) snapshot after bunch 9 at time = 126 ns



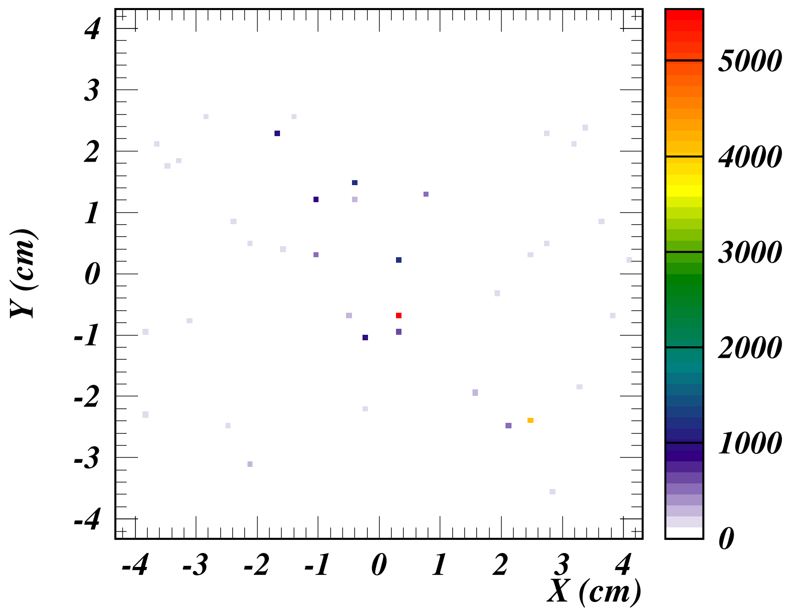
No energy cut: 9467 macroparticles, 214959696 e-



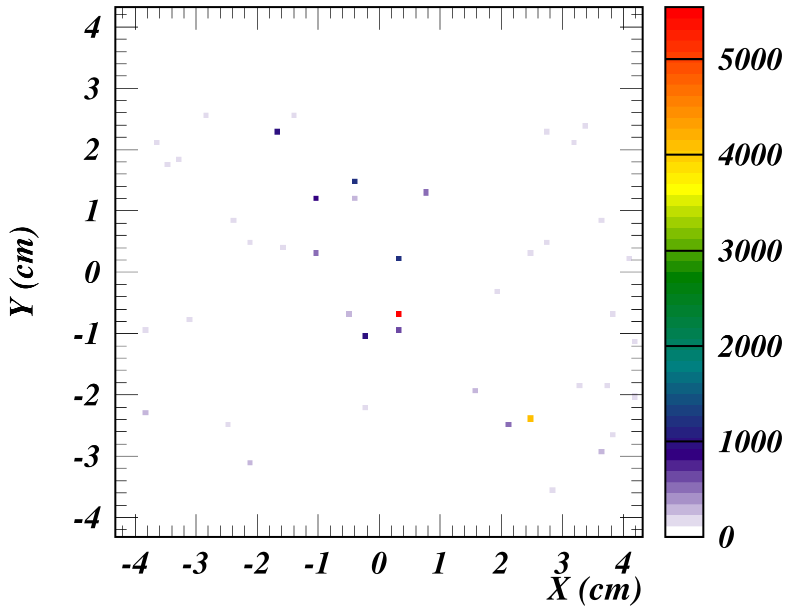
E_{kin}>50 eV: 290 macroparticles, 12754127 e-


14/08/19 16.17
Cloud charge (N_e) snapshot after bunch 10 at time = 140 ns
x 10^2
9000
8000
7000
6000
5000
4000
3000
2000
1000
0
Y (cm)
X (cm)
No energy cut: 10069 macroparticles, 232899216 e-
x 10^2
1400
1200
1000
800
600
400
200
0
Y (cm)
X (cm)
E_{kin}>50 eV: 389 macroparticles, 16119028 e-

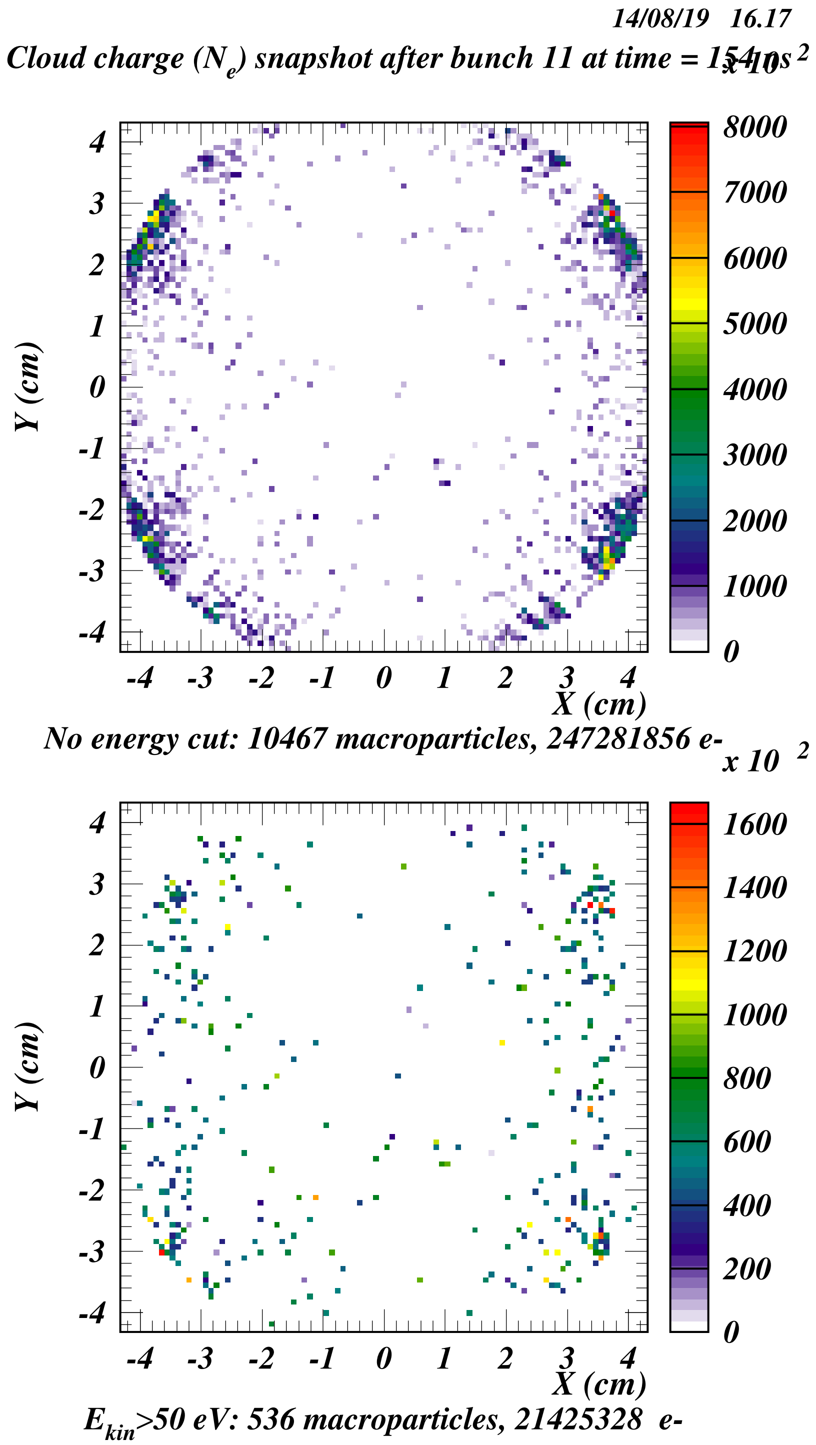
Cloud energy (eV) snapshot after bunch 10 at time = 140 ns



No energy cut: 10069 macroparticles, 232899216 e-

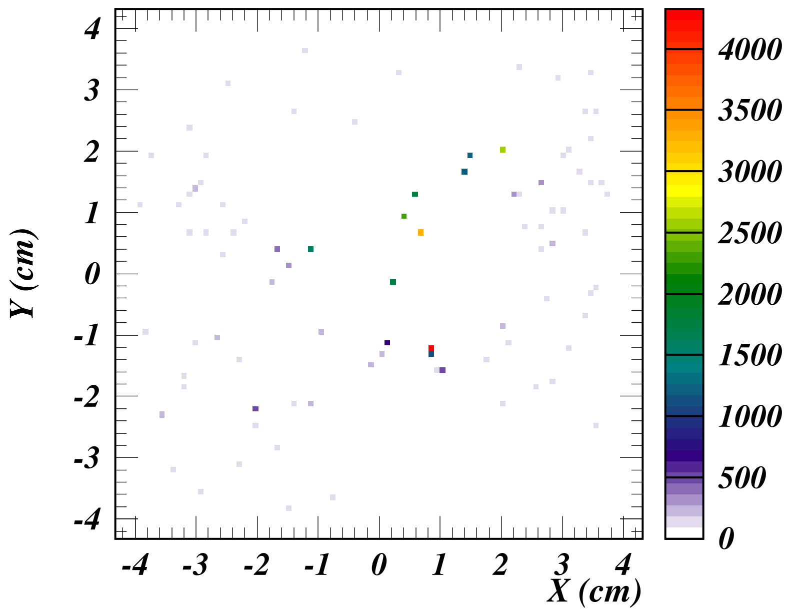


E_{kin}>50 eV: 389 macroparticles, 16119028 e-

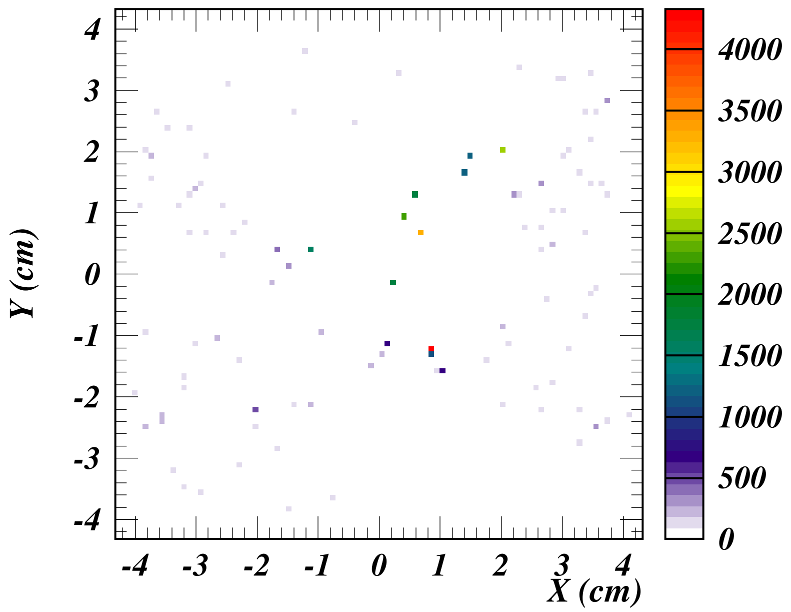

14/08/19 16.17
Cloud charge (N_e) snapshot after bunch 11 at time = 154 ns
x 10 2
Y (cm)
X (cm)
No energy cut: 10467 macroparticles, 247281856 e-
x 10 2
Y (cm)
X (cm)
E_{kin}>50 eV: 536 macroparticles, 21425328 e-

14/08/19 16.17

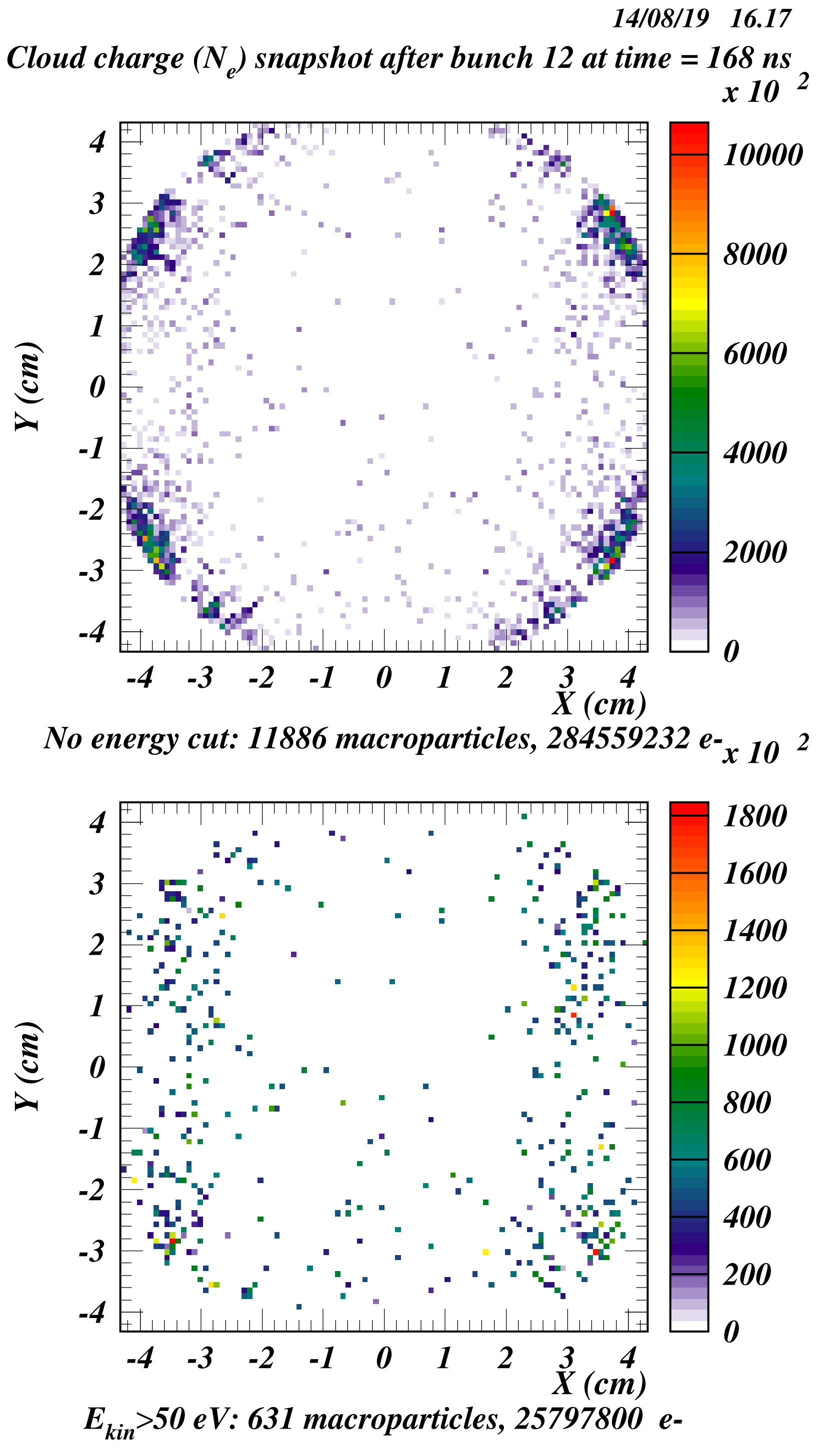
Cloud energy (eV) snapshot after bunch 11 at time = 154 ns



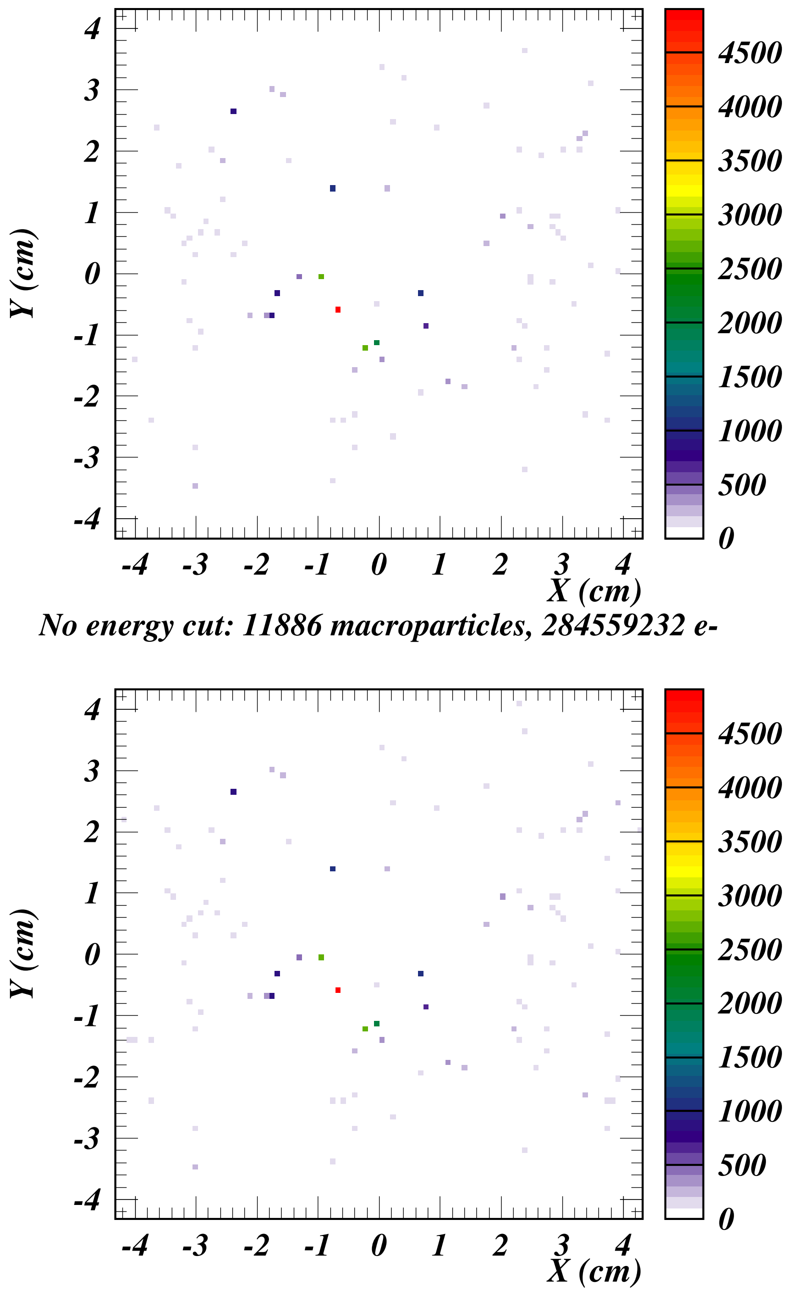
No energy cut: 10467 macroparticles, 247281856 e-



E_{kin}>50 eV: 536 macroparticles, 21425328 e-

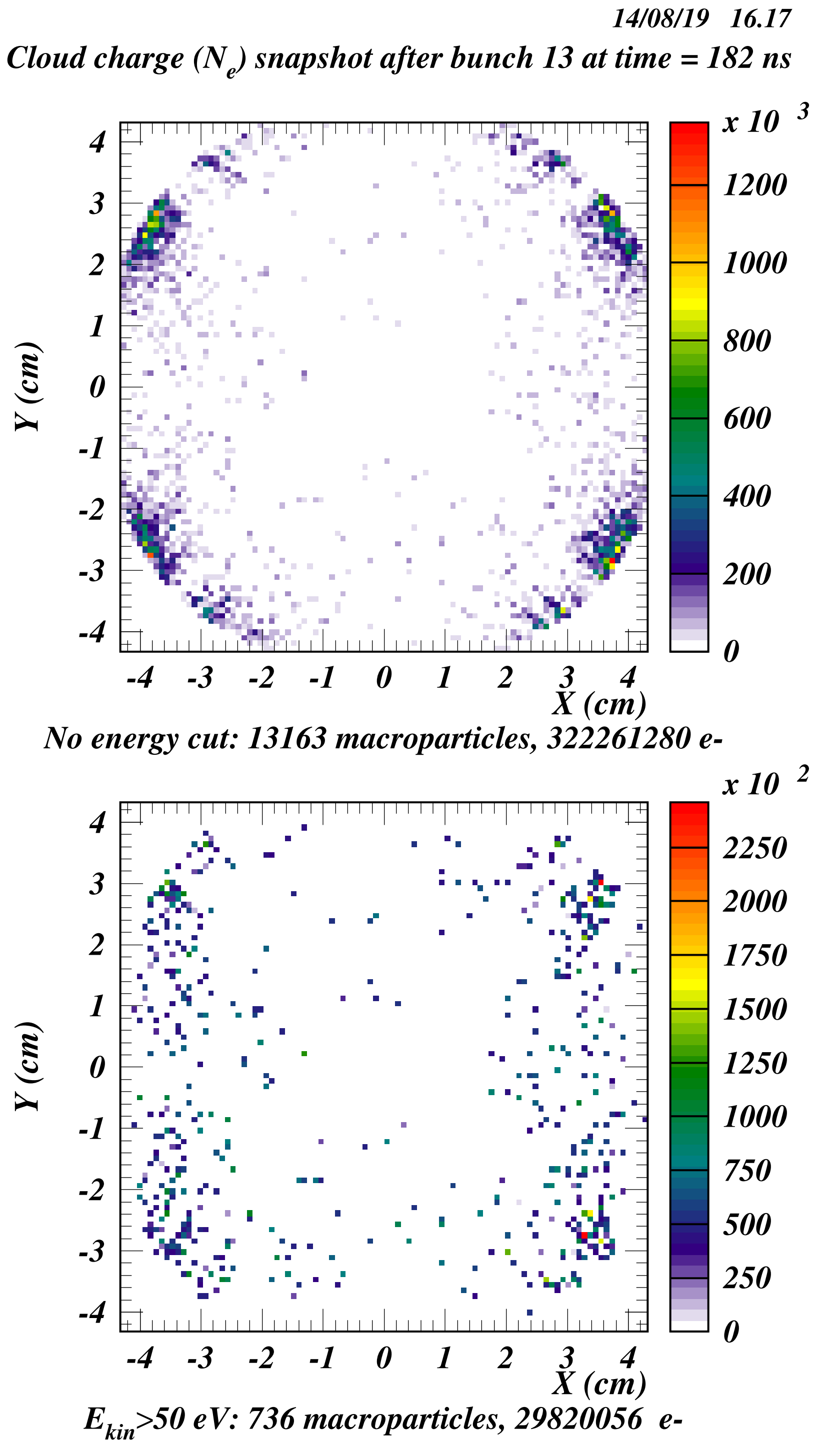

14/08/19 16.17
Cloud charge (N_e) snapshot after bunch 12 at time = 168 ns
x 10 2
Y (cm)
X (cm)
No energy cut: 11886 macroparticles, 284559232 e-
x 10 2
Y (cm)
X (cm)
E_{kin}>50 eV: 631 macroparticles, 25797800 e-

Cloud energy (eV) snapshot after bunch 12 at time = 168 ns



No energy cut: 11886 macroparticles, 284559232 e-

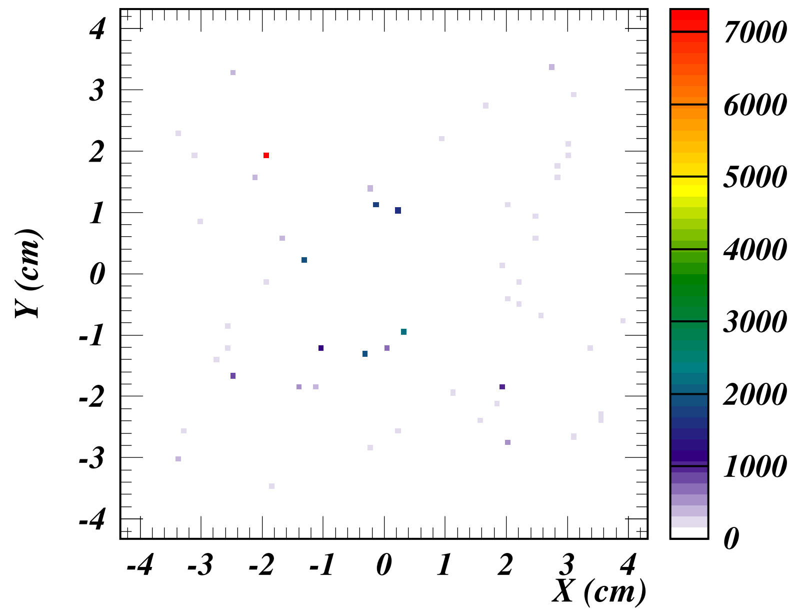
E_{kin}>50 eV: 631 macroparticles, 25797800 e-



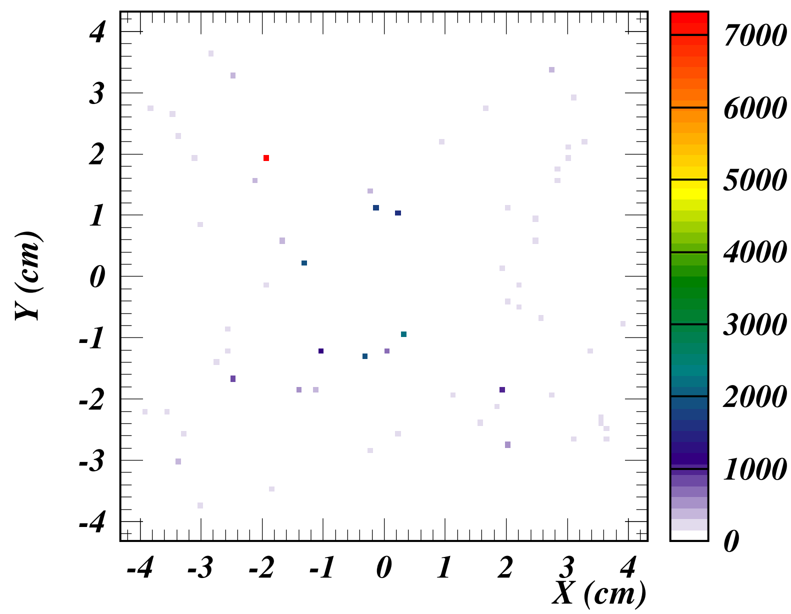
14/08/19 16.17
Cloud charge (N_e) snapshot after bunch 13 at time = 182 ns
Y (cm)
X (cm)
x 10 ^{3}
1200
1000
800
600
400
200
0
No energy cut: 13163 macroparticles, 322261280 e-
Y (cm)
X (cm)
x 10 ^{2}
2250
2000
1750
1500
1250
1000
750
500
250
0
E_{kin}>50 eV: 736 macroparticles, 29820056 e-

14/08/19 16.17

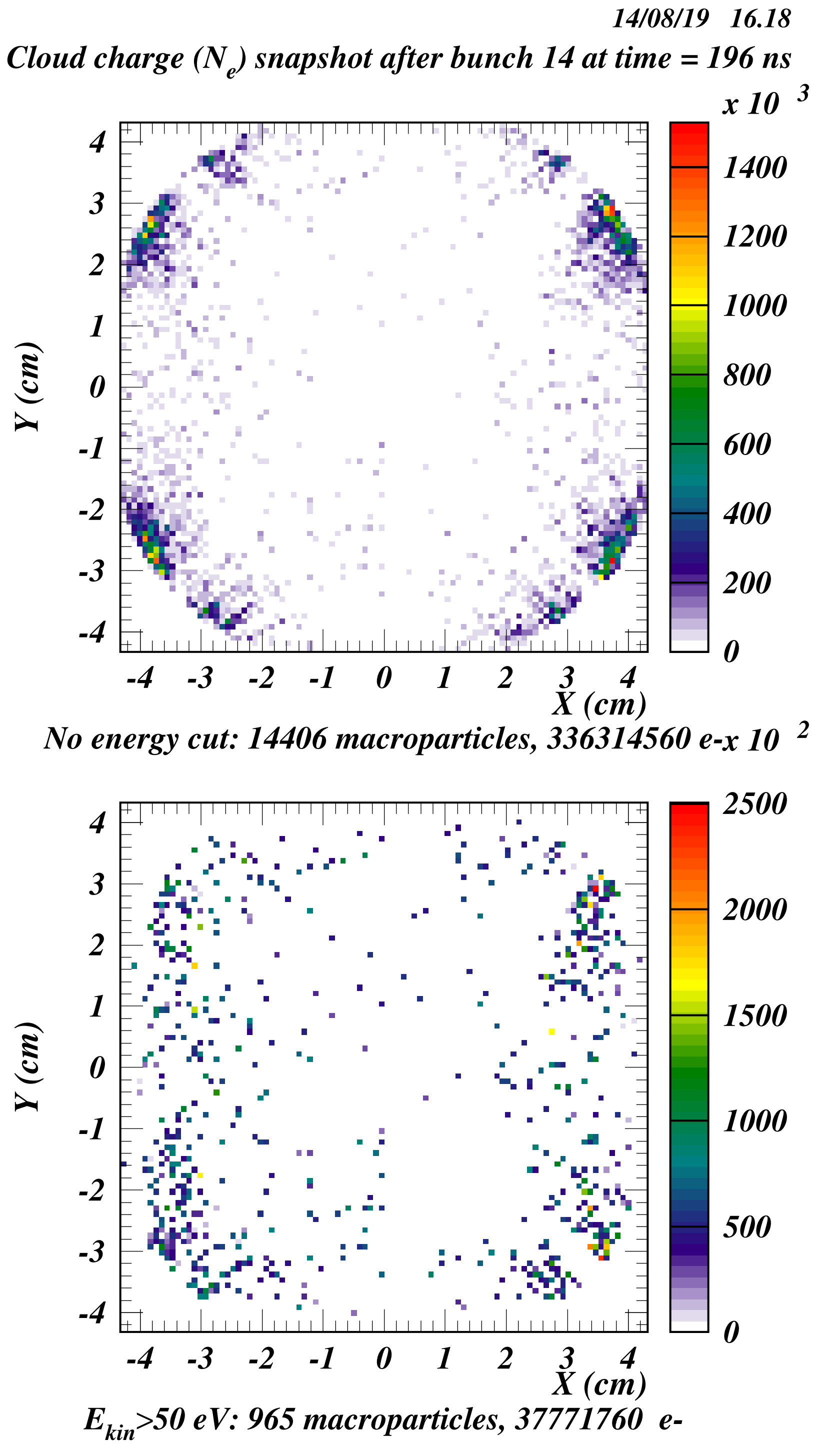
Cloud energy (eV) snapshot after bunch 13 at time = 182 ns



No energy cut: 13163 macroparticles, 322261280 e-

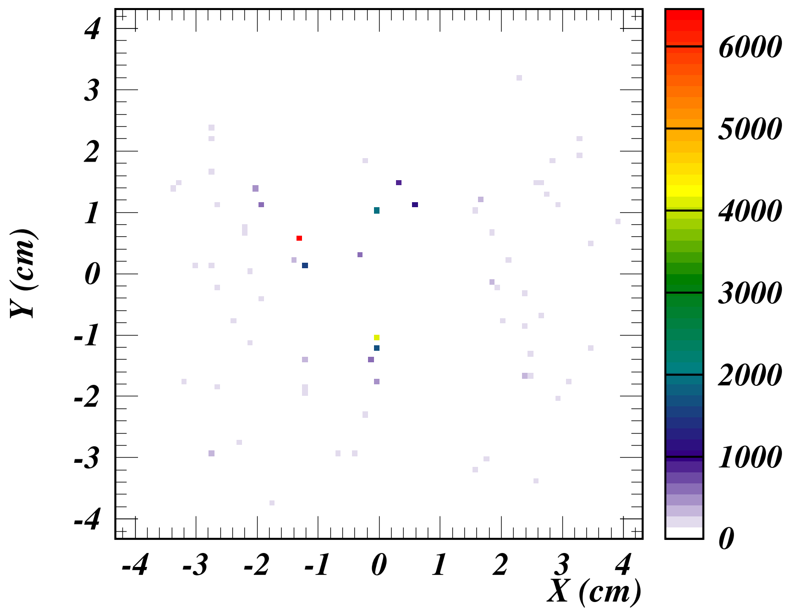


E_{kin}>50 eV: 736 macroparticles, 29820056 e-

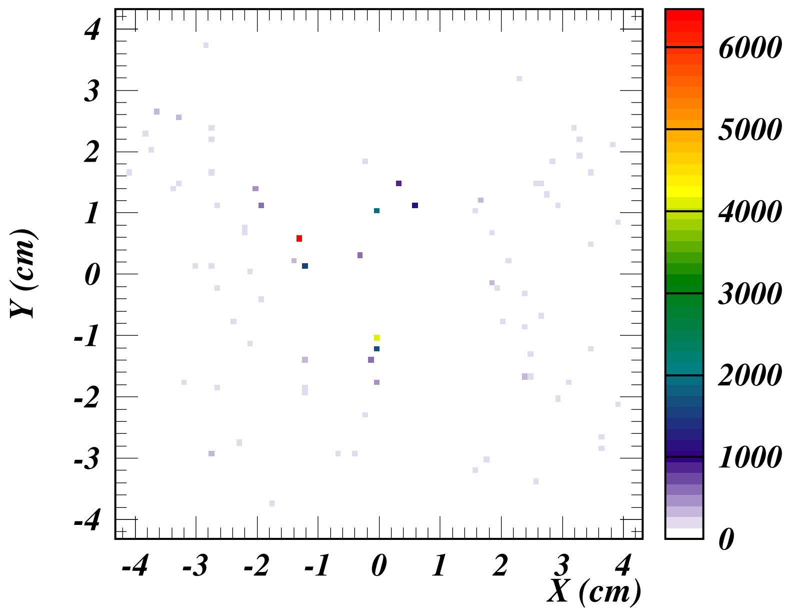

14/08/19 16.18
Cloud charge (N_e) snapshot after bunch 14 at time = 196 ns
x 10 ^{3}
1400
1200
1000
800
600
400
200
0
Y (cm)
X (cm)
No energy cut: 14406 macroparticles, 336314560 e-
x 10 ^{2}
2500
2000
1500
1000
500
0
Y (cm)
X (cm)
E_{kin}>50 eV: 965 macroparticles, 37771760 e-

14/08/19 16.18

Cloud energy (eV) snapshot after bunch 14 at time = 196 ns



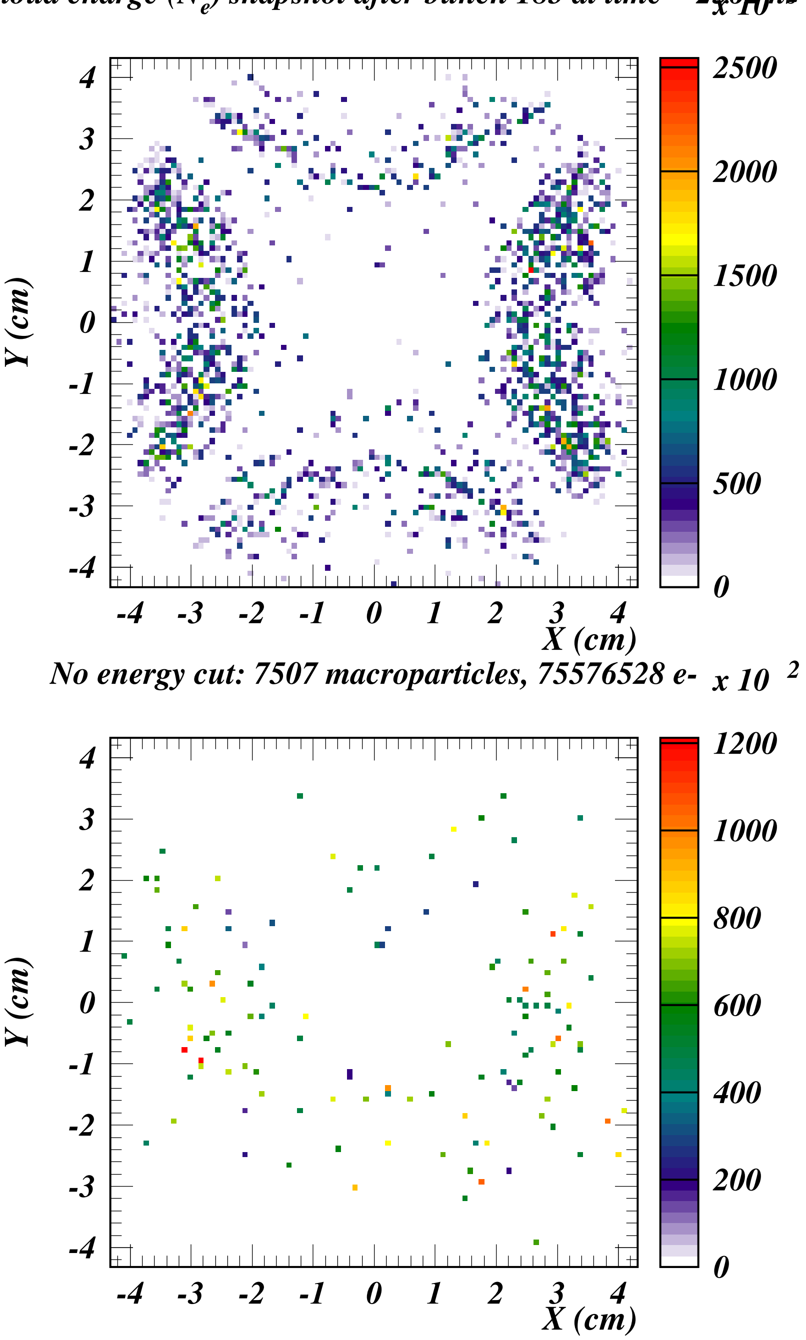
No energy cut: 14406 macroparticles, 336314560 e-



E_{kin}>50 eV: 965 macroparticles, 37771760 e-

14/08/19 16.18

Cloud charge (N_e) snapshot after bunch 183 at time = 2562 ns

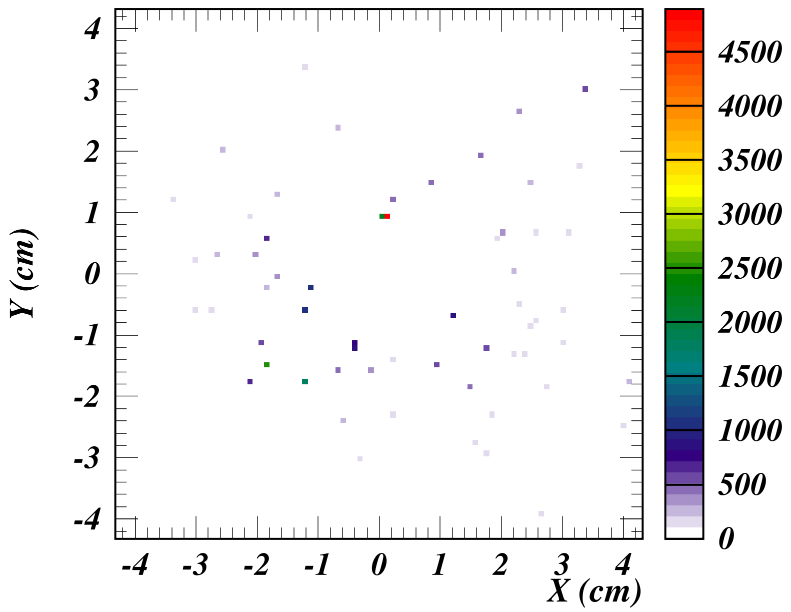


No energy cut: 7507 macroparticles, 75576528 e-

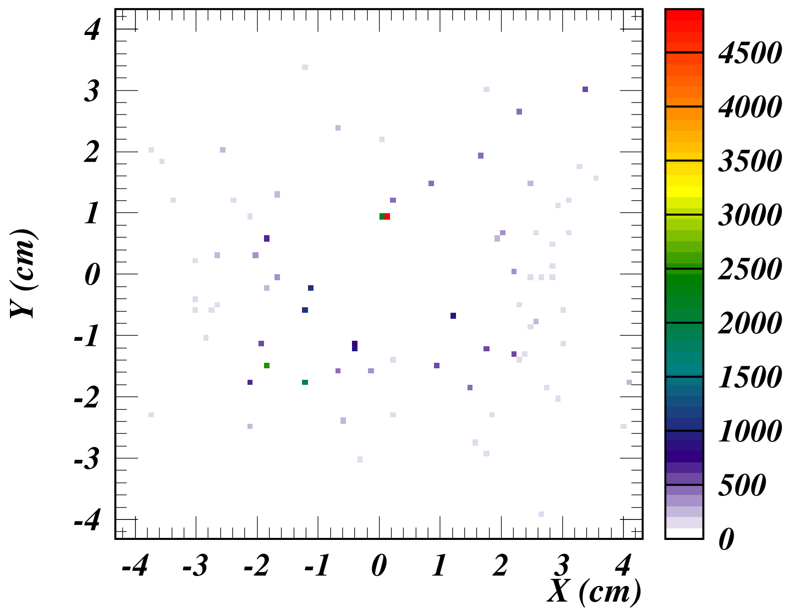
E_{kin}>50 eV: 166 macroparticles, 7784537 e-

14/08/19 16.18

Cloud energy (eV) snapshot after bunch 183 at time = 2562 ns



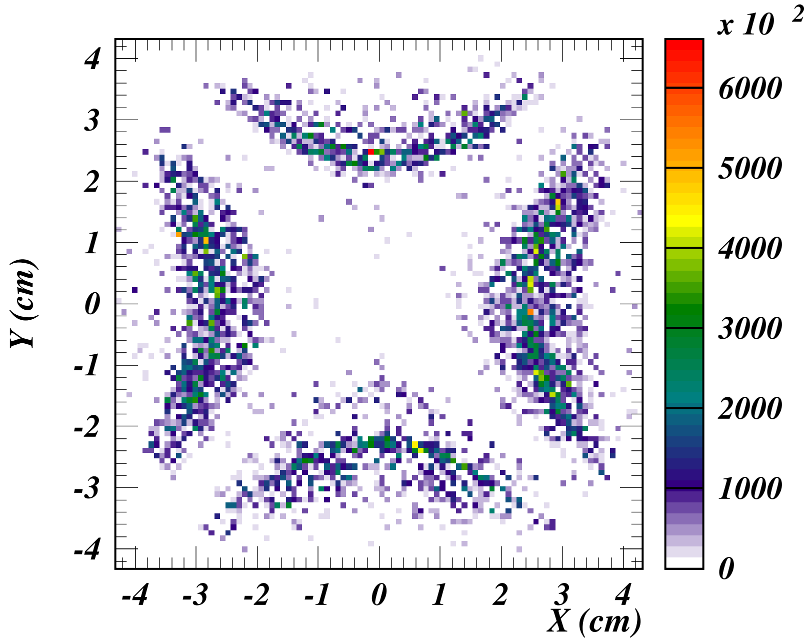
No energy cut: 7507 macroparticles, 75576528 e-



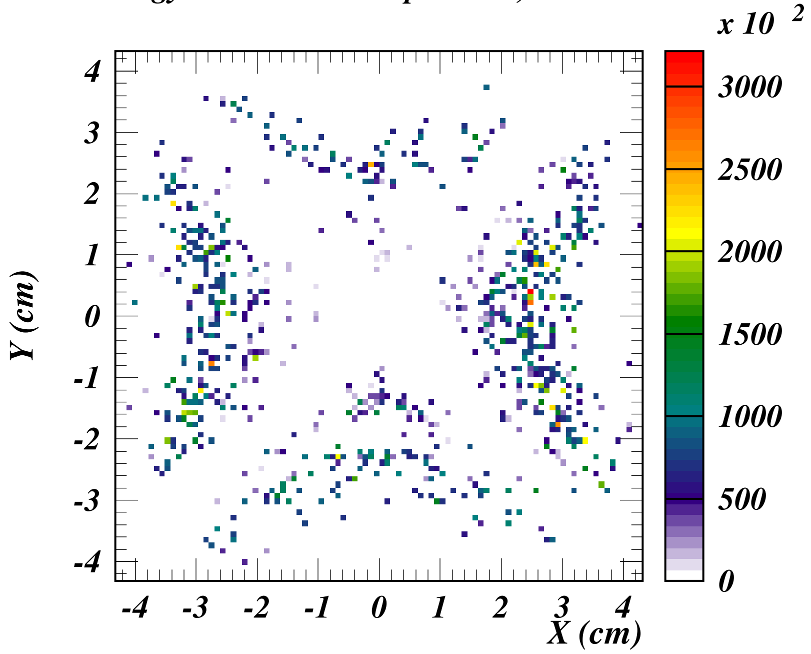
E_{kin}>50 eV: 166 macroparticles, 7784537 e-

14/08/19 16.18

Cloud charge (N_e) snapshot after bunch 366 at time = 5124 ns



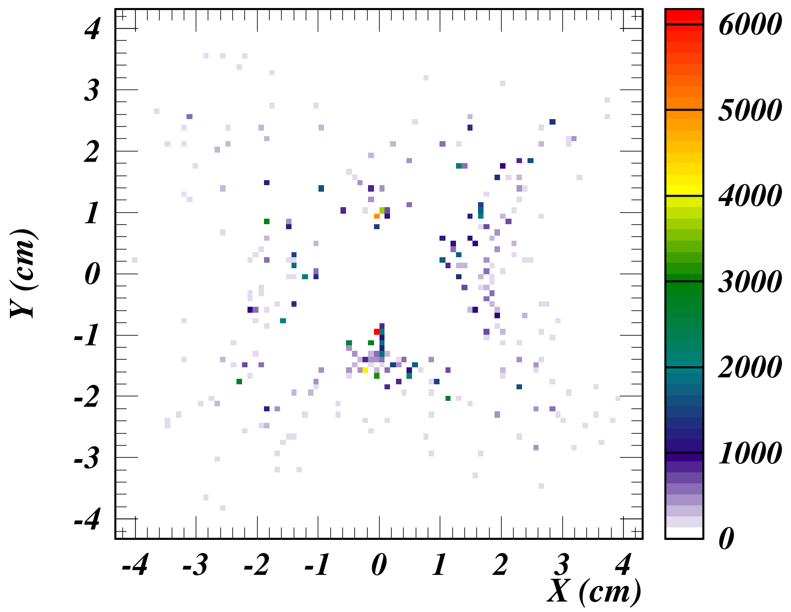
No energy cut: 7000 macroparticles, 222740992 e-



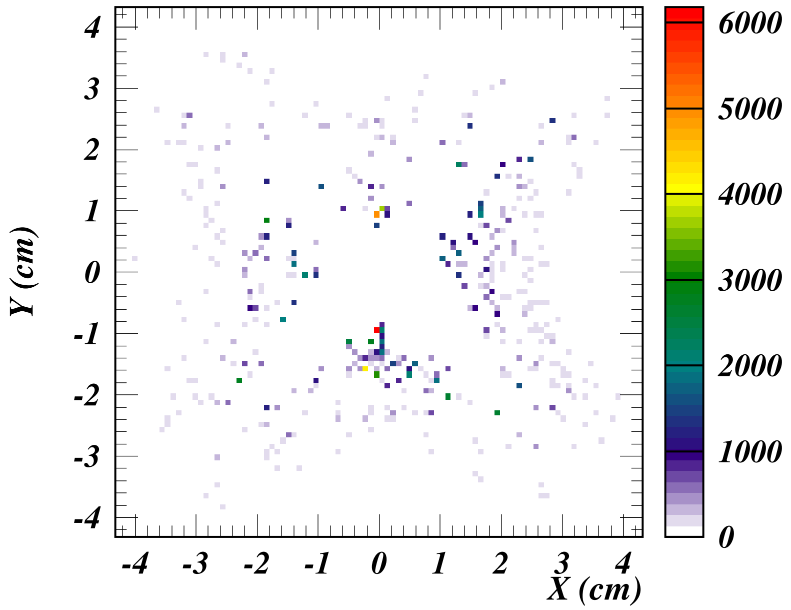
E_{kin}>50 eV: 1223 macroparticles, 55879360 e-

14/08/19 16.18

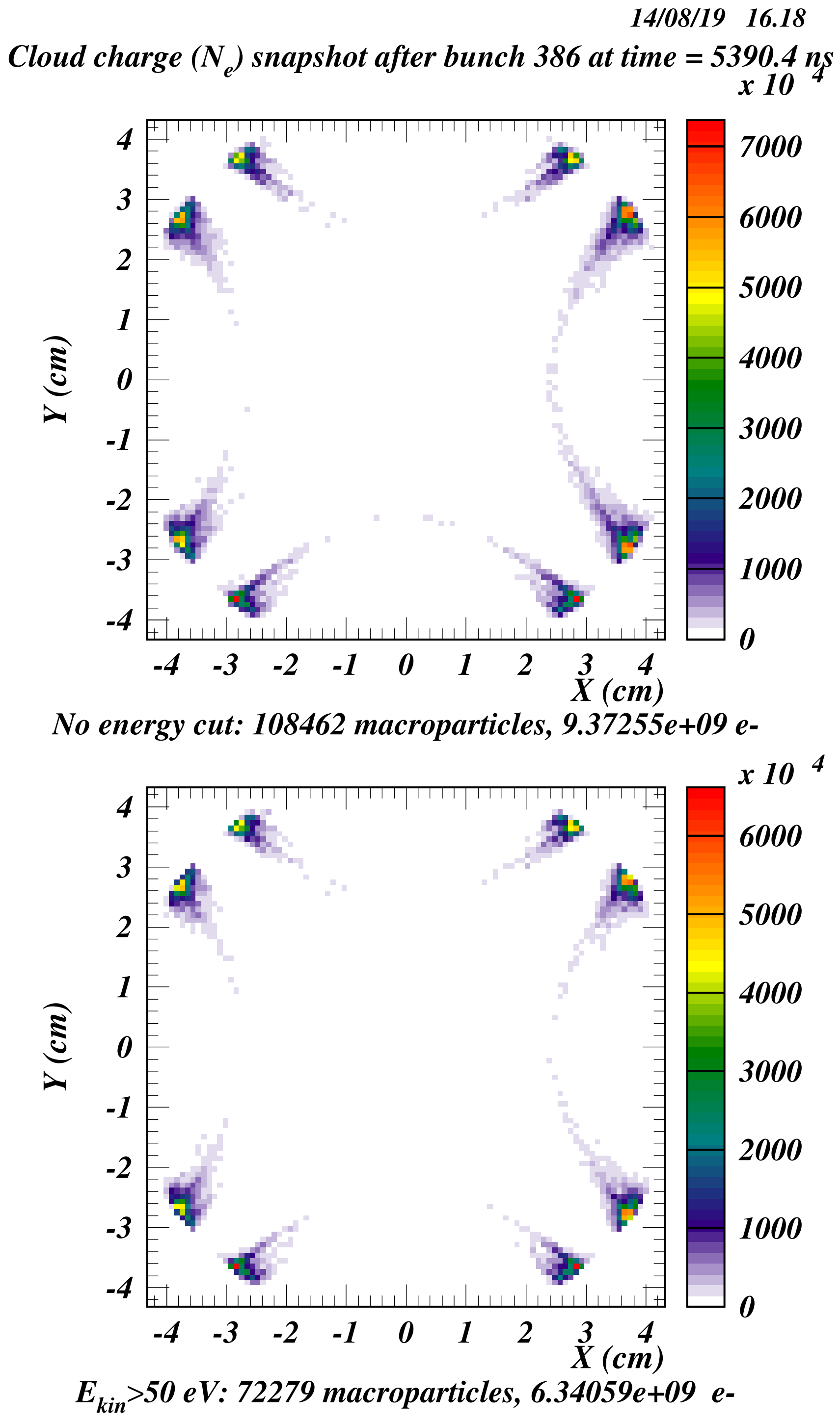
Cloud energy (eV) snapshot after bunch 366 at time = 5124 ns



No energy cut: 7000 macroparticles, 222740992 e-

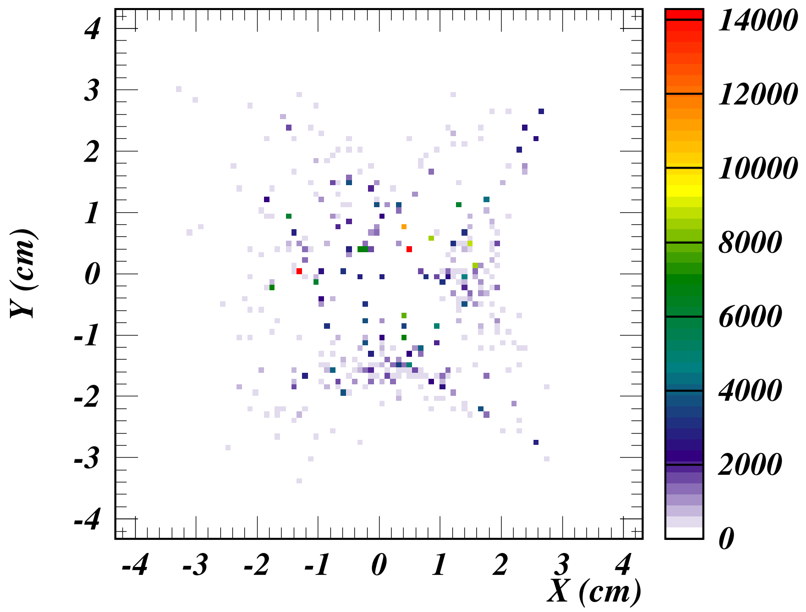


E_{kin}>50 eV: 1223 macroparticles, 55879360 e-

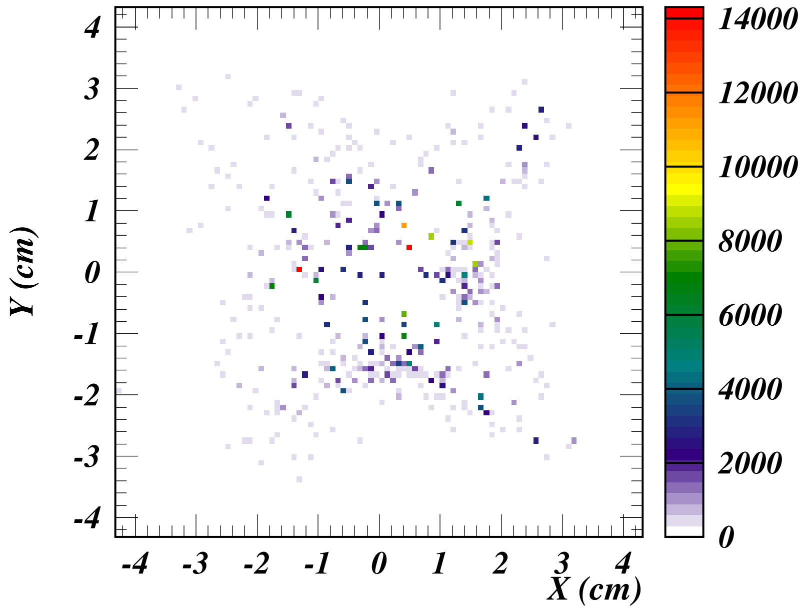

14/08/19 16.18
Cloud charge (N_e) snapshot after bunch 386 at time = 5390.4 ns
x 10^4
7000
6000
5000
4000
3000
2000
1000
0
Y (cm)
X (cm)
No energy cut: 108462 macroparticles, 9.37255e+09 e-
x 10^4
6000
5000
4000
3000
2000
1000
0
Y (cm)
X (cm)
E_kin>50 eV: 72279 macroparticles, 6.34059e+09 e-

14/08/19 16.18

Cloud energy (eV) snapshot after bunch 386 at time = 5390.4 ns



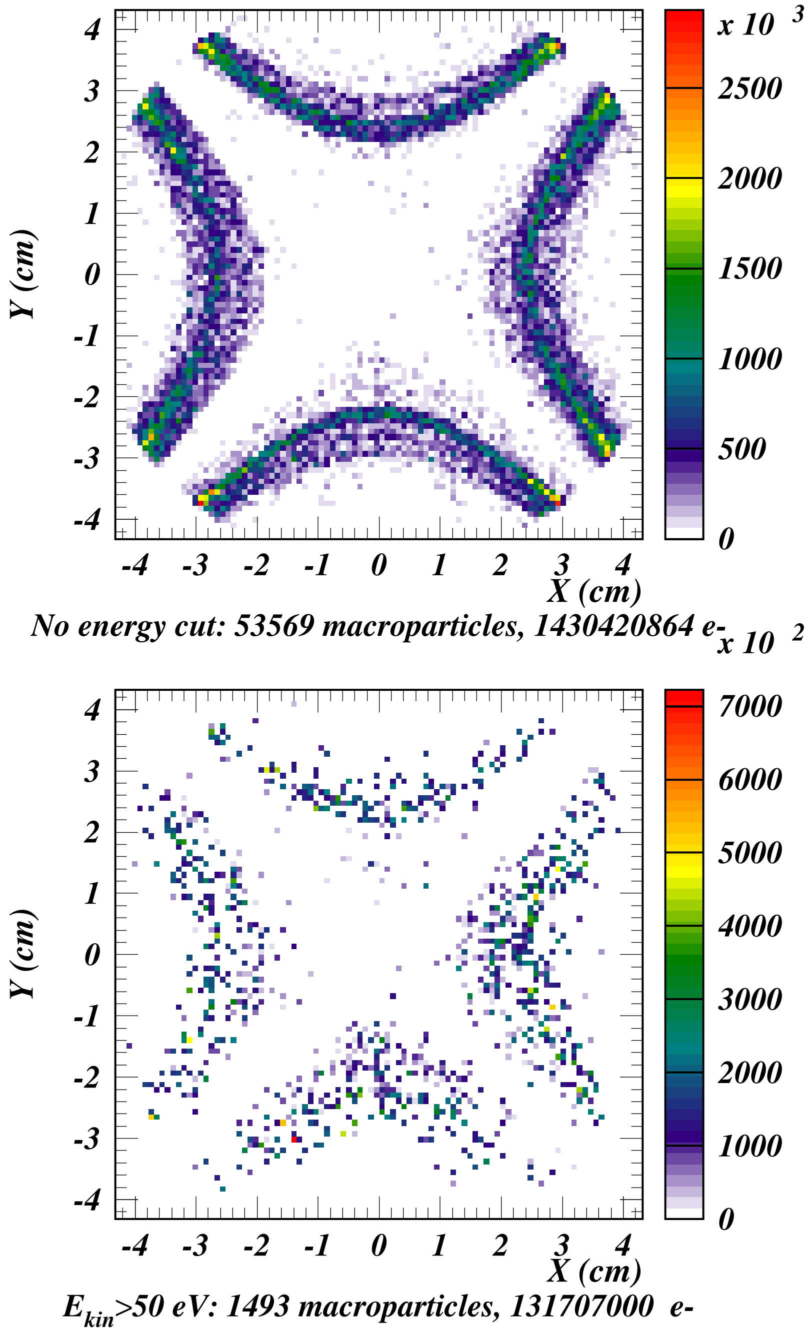
No energy cut: 108462 macroparticles, 9.37255e+09 e-



E_{kin}>50 eV: 72279 macroparticles, 6.34059e+09 e-

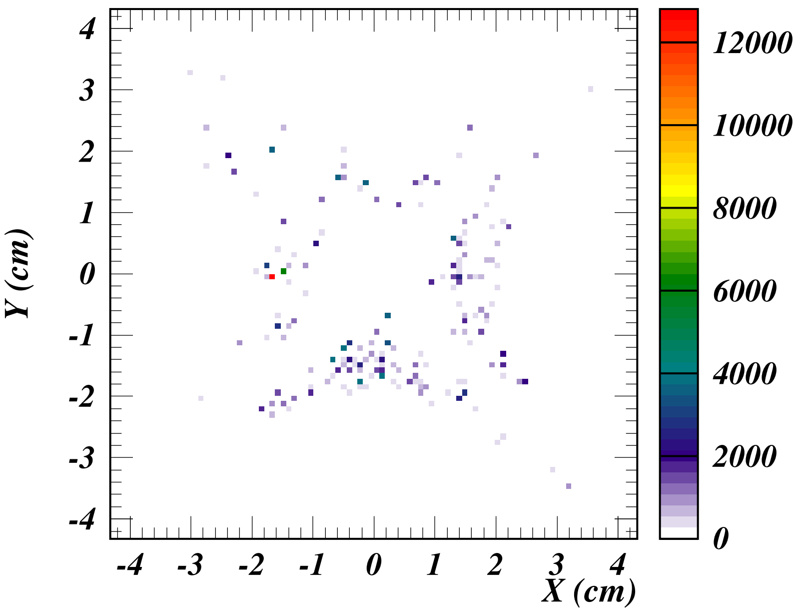
14/08/19 16.18

Cloud charge (N_e) snapshot after bunch 397 at time = 5544 ns

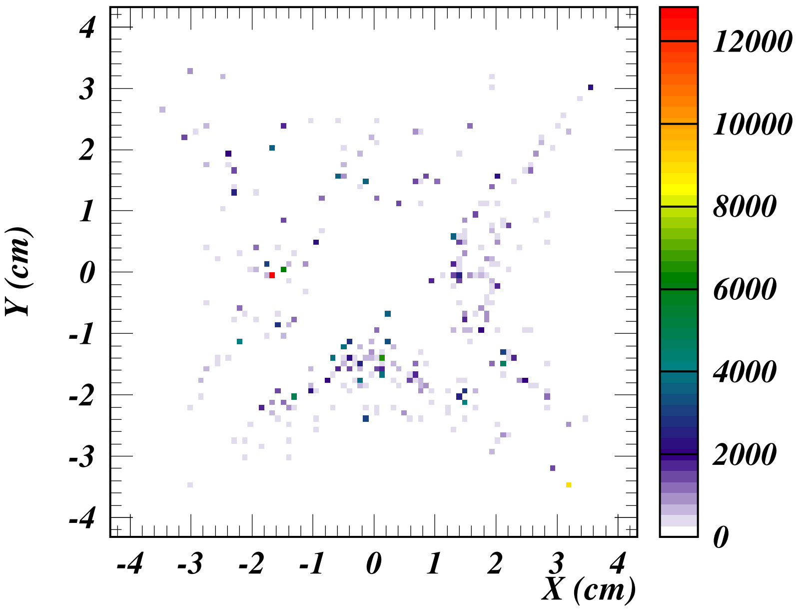


14/08/19 16.18

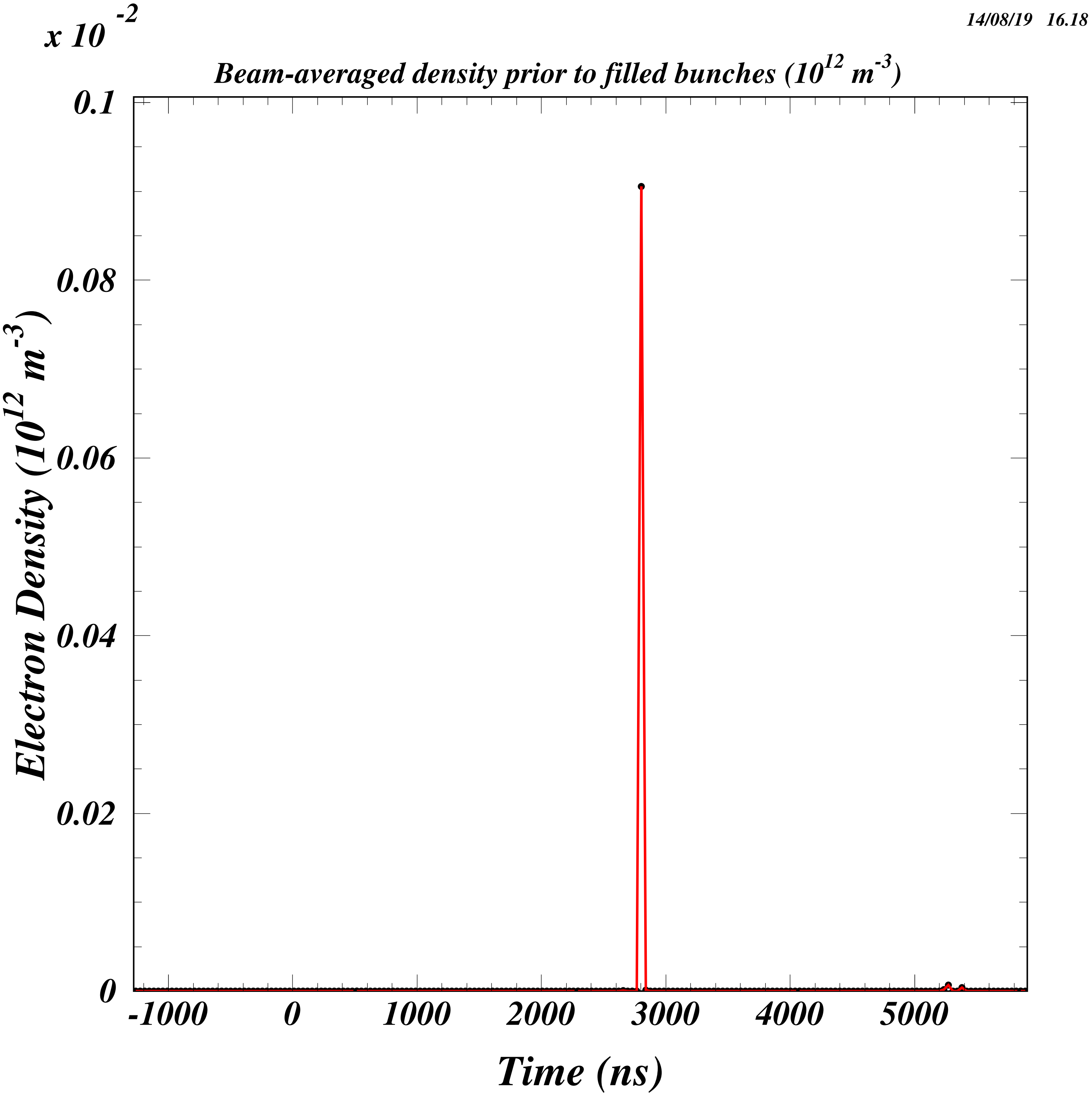
Cloud energy (eV) snapshot after bunch 397 at time = 5544 ns



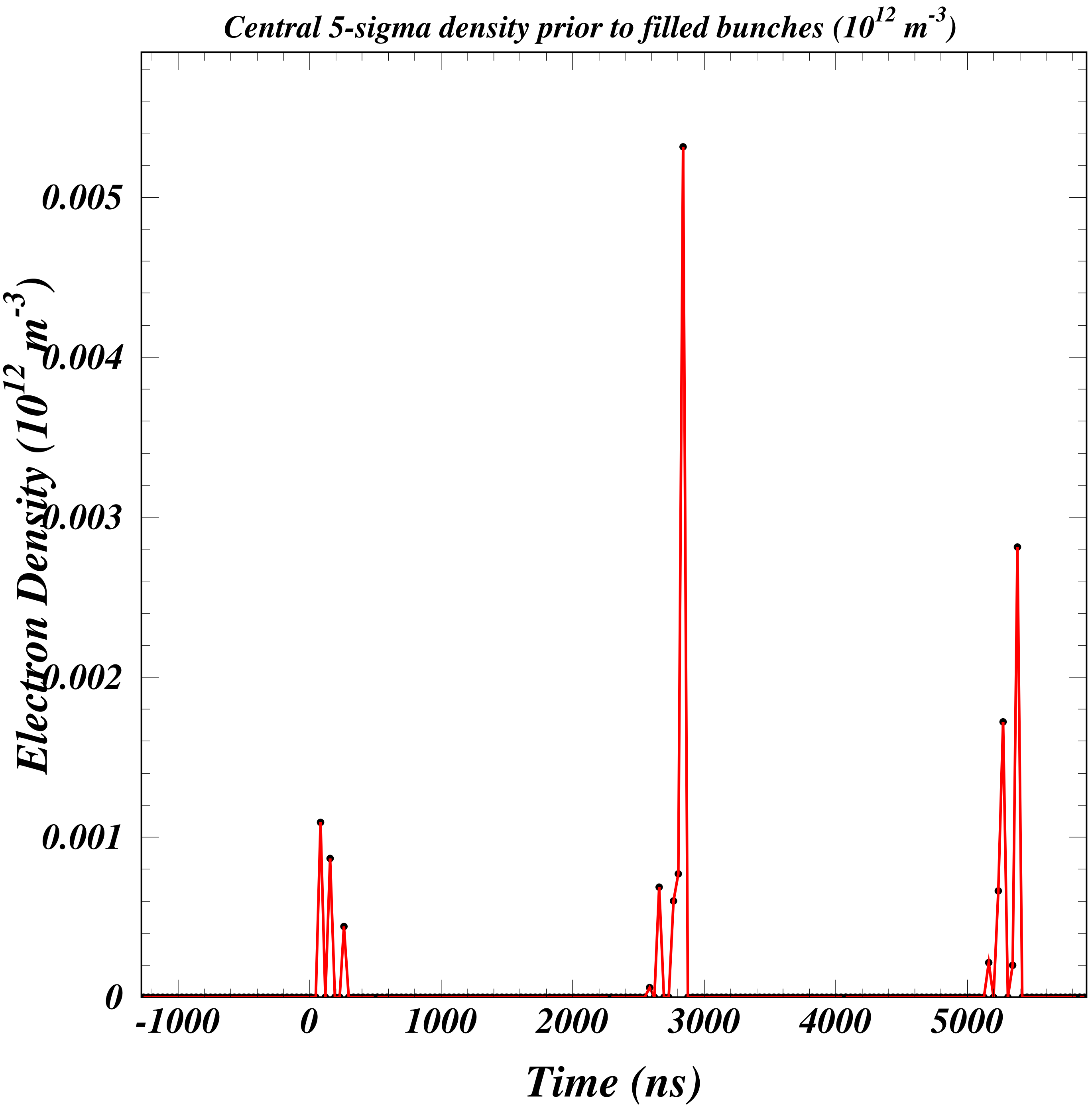
No energy cut: 53569 macroparticles, 1430420864 e-

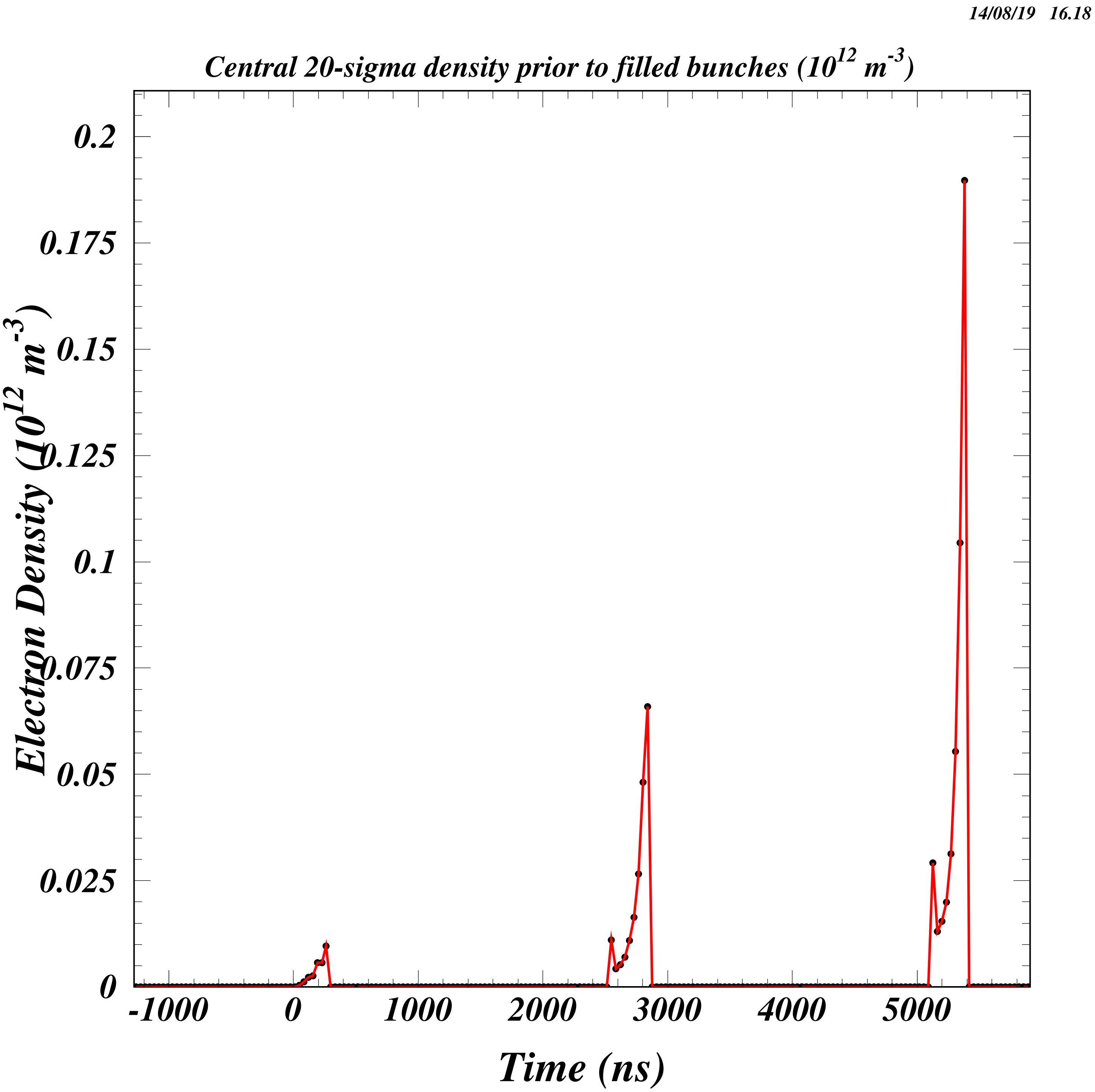


E_{kin}>50 eV: 1493 macroparticles, 131707000 e-

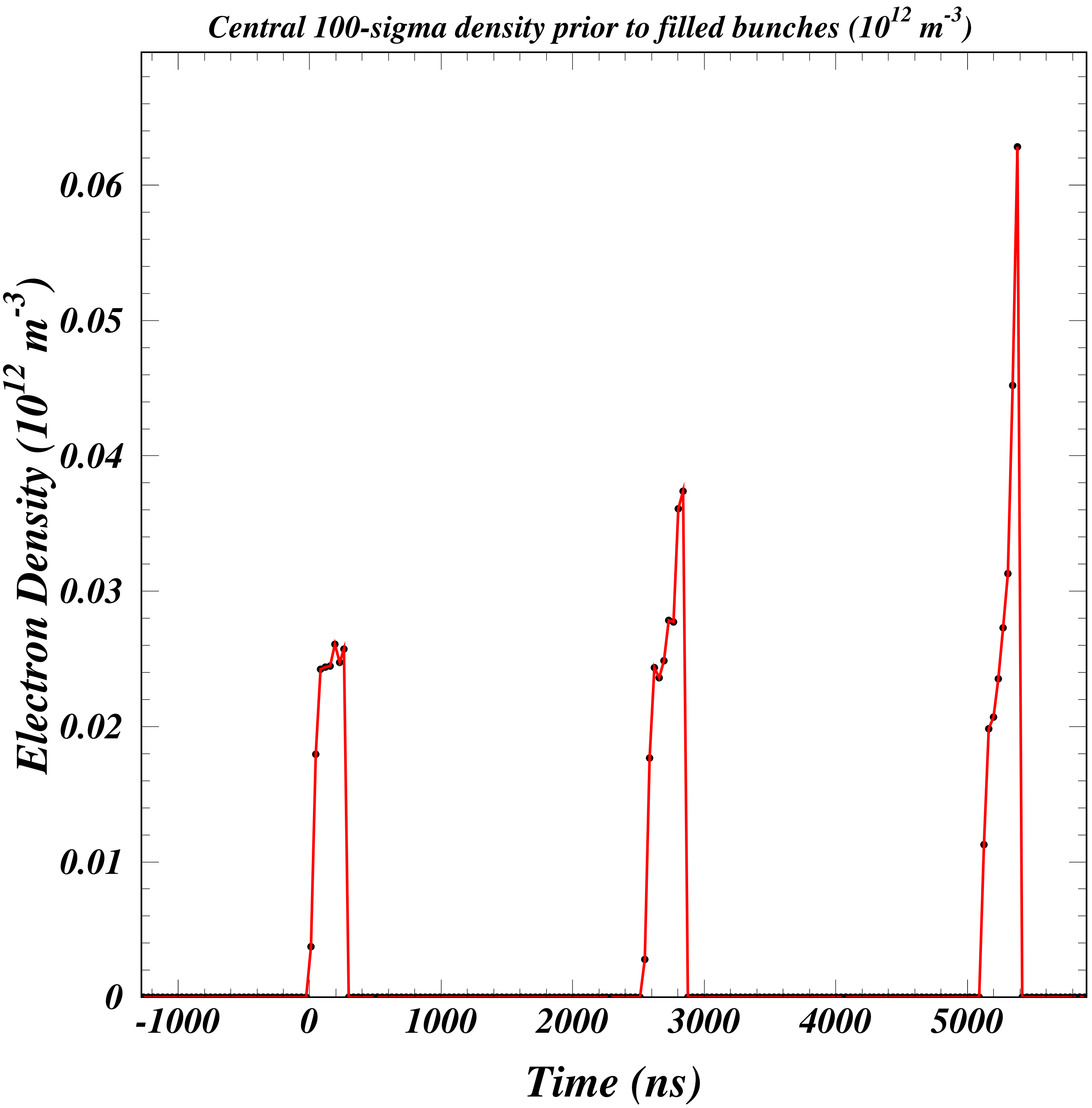


x 10 -2
14/08/19 16.18
Beam-averaged density prior to filled bunches (10^{12} m^{-3})
0.1
0.08
0.06
0.04
0.02
0
Electron Density (10^{12} m^{-3})
-1000
0
1000
2000
3000
4000
5000
Time (ns)


Central 5-sigma density prior to filled bunches (10^{12} m^{-3})
Electron Density (10^{12} m^{-3})
0.005
0.004
0.003
0.002
0.001
0
-1000
0
1000
2000
3000
4000
5000
Time (ns)

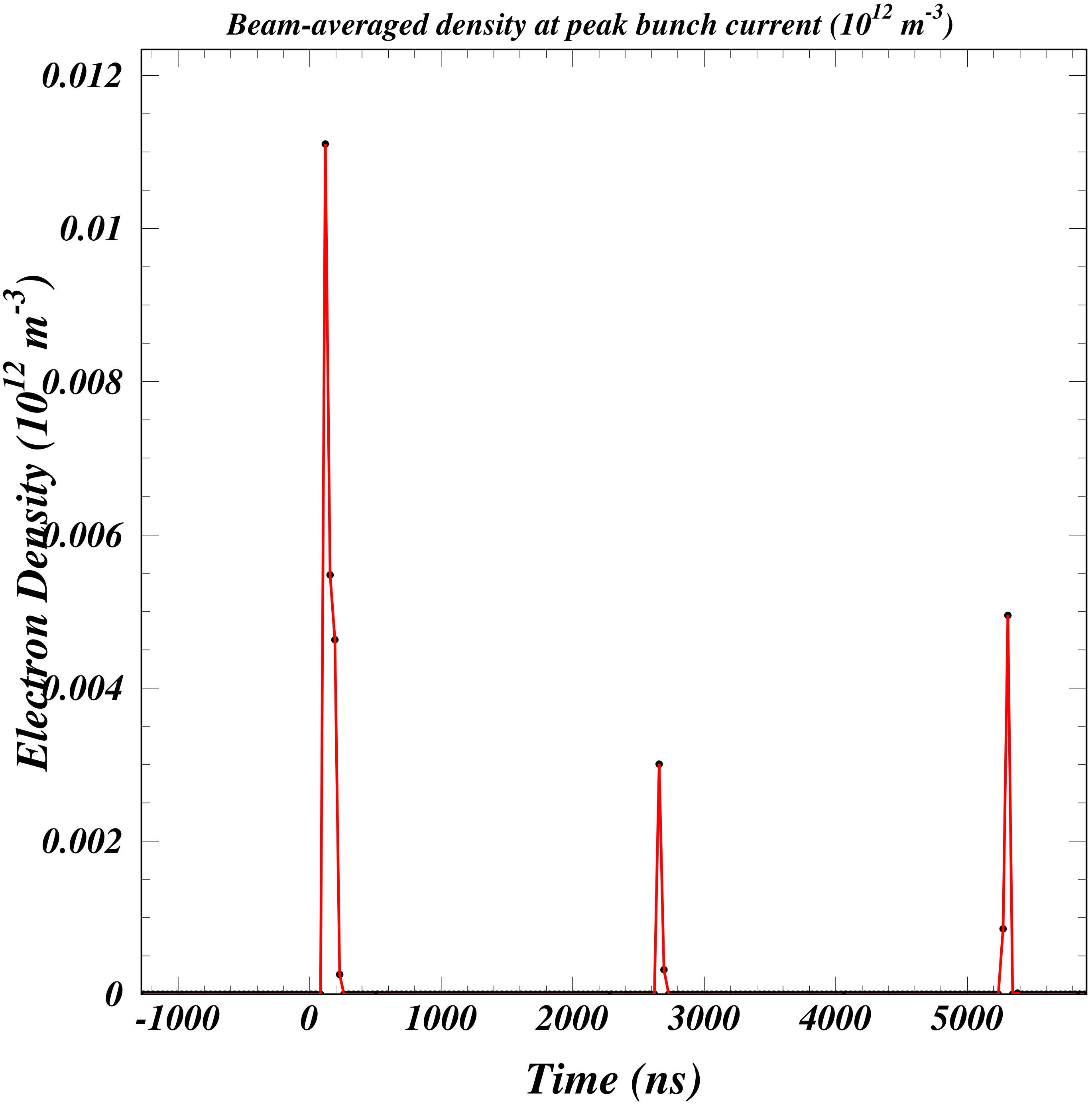

14/08/19 16.18
Central 20-sigma density prior to filled bunches (10^{12} m^{-3})
Electron Density (10^{12} m^{-3})
0.2
0.175
0.15
0.125
0.1
0.075
0.05
0.025
0
-1000
0
1000
2000
3000
4000
5000
Time (ns)

14/08/19 16.18

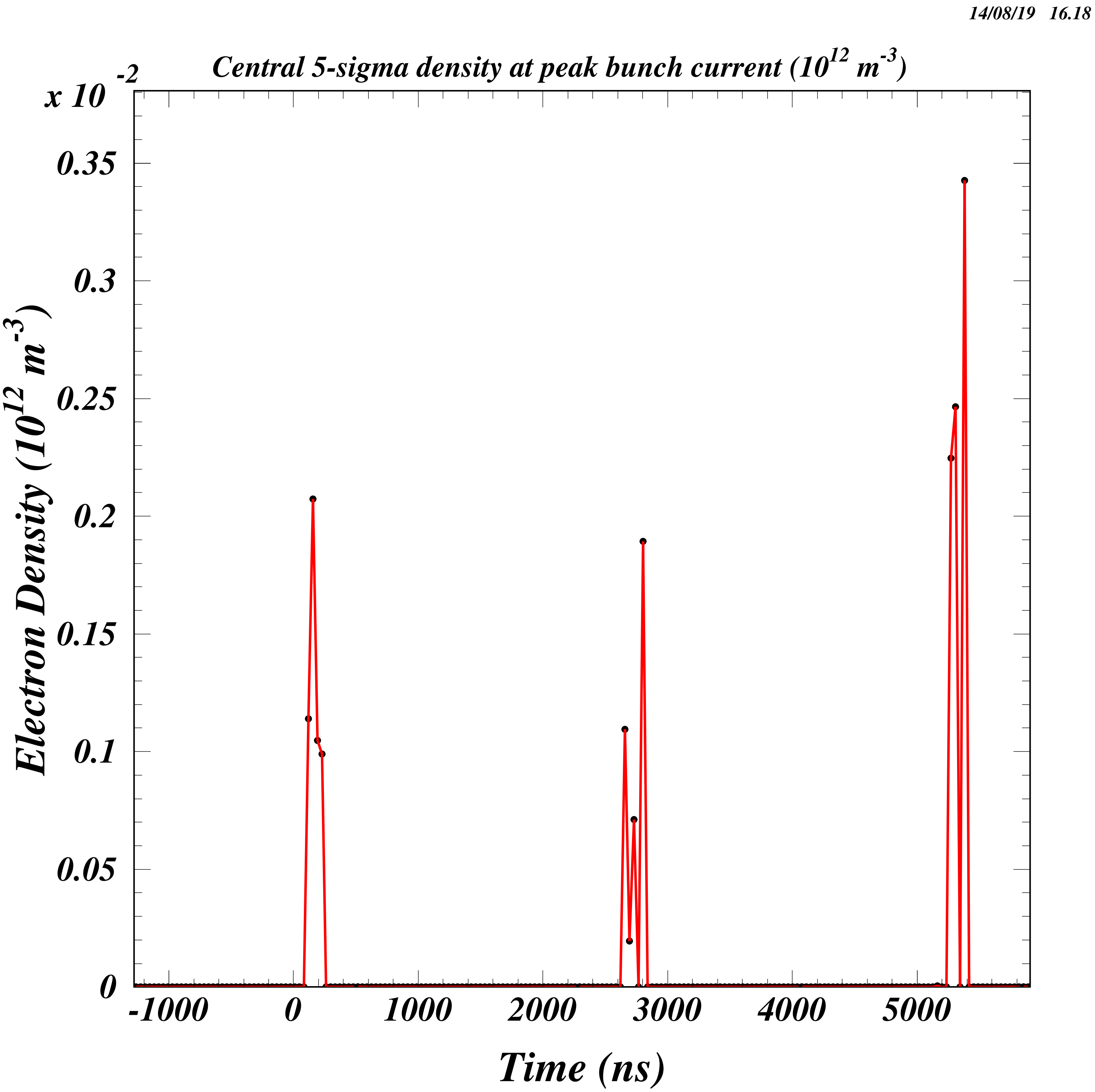


Central 100-sigma density prior to filled bunches (10^{12} m^{-3})
Electron Density (10^{12} m^{-3})
0
0.01
0.02
0.03
0.04
0.05
0.06
-1000
0
1000
2000
3000
4000
5000
Time (ns)

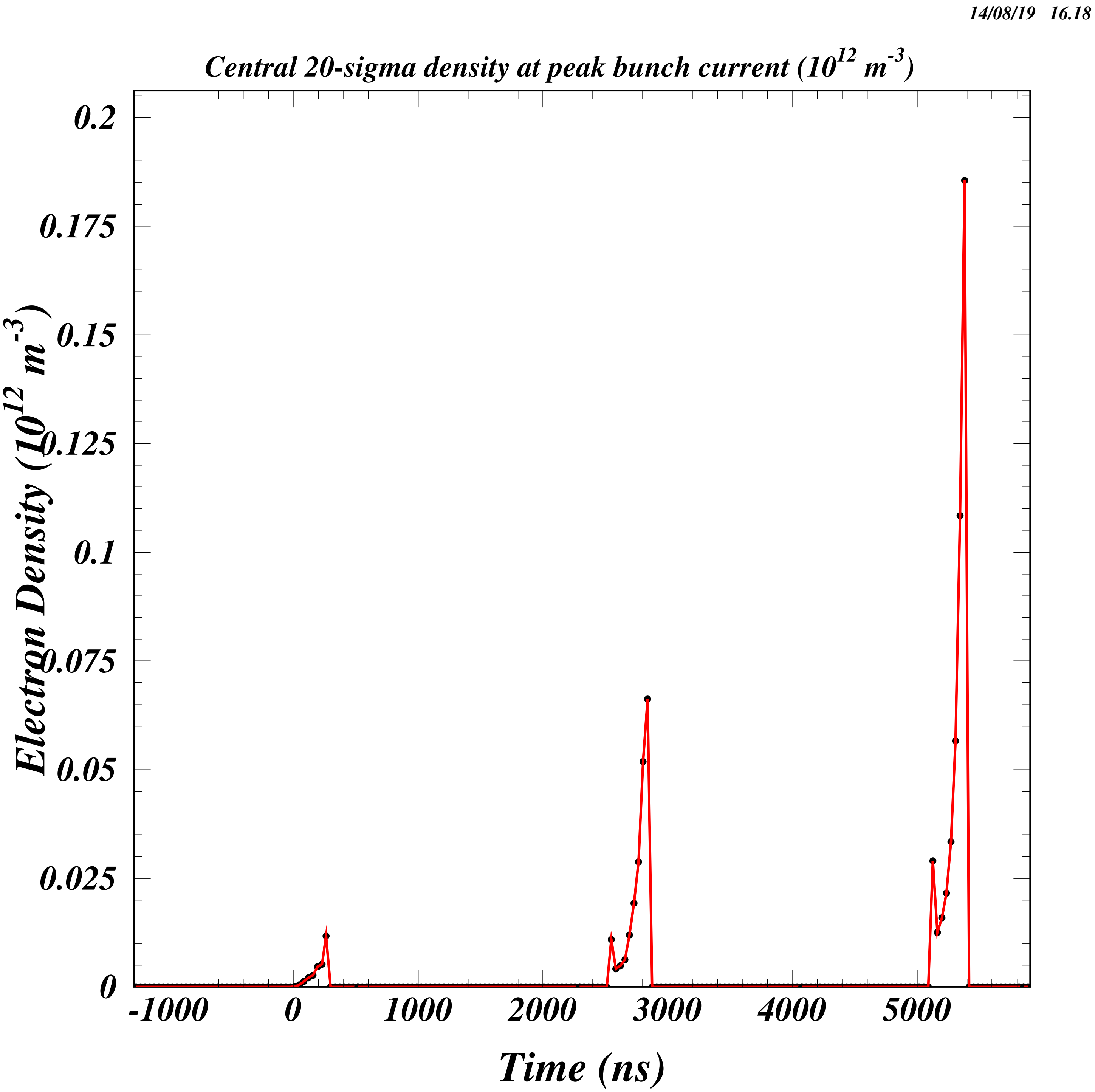
14/08/19 16.18

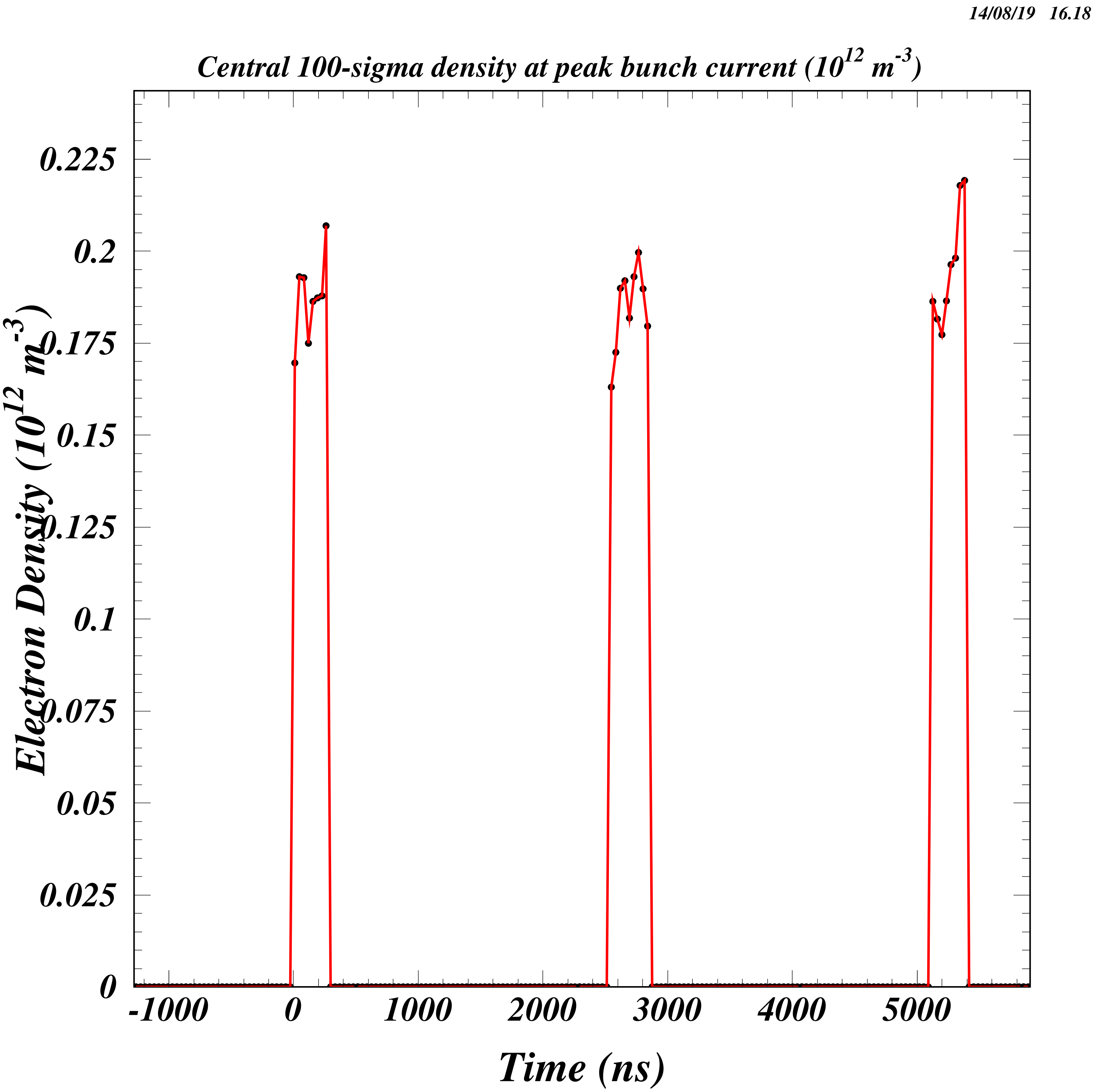


Beam-averaged density at peak bunch current (10^{12} m^{-3})
Electron Density (10^{12} m^{-3})
0.012
0.01
0.008
0.006
0.004
0.002
0
-1000
0
1000
2000
3000
4000
5000
Time (ns)



14/08/19 16.18
Central 5-sigma density at peak bunch current (10^{12} m^{-3})
x 10^{-2}
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
Electron Density (10^{12} m^{-3})
-1000
0
1000
2000
3000
4000
5000
Time (ns)


14/08/19 16.18
Central 20-sigma density at peak bunch current (10^{12} m^{-3})
Electron Density (10^{12} m^{-3})
0.2
0.175
0.15
0.125
0.1
0.075
0.05
0.025
0
-1000
0
1000
2000
3000
4000
5000
Time (ns)


14/08/19 16.18
Central 100-sigma density at peak bunch current (10^{12} m^{-3})
Electron Density (10^{12} m^{-3})
0.225
0.2
0.175
0.15
0.125
0.1
0.075
0.05
0.025
0
-1000
0
1000
2000
3000
4000
5000
Time (ns)