Correlation of Electric Fields with Gamma Ray Fluxes Generated by Radon-222 Progenies

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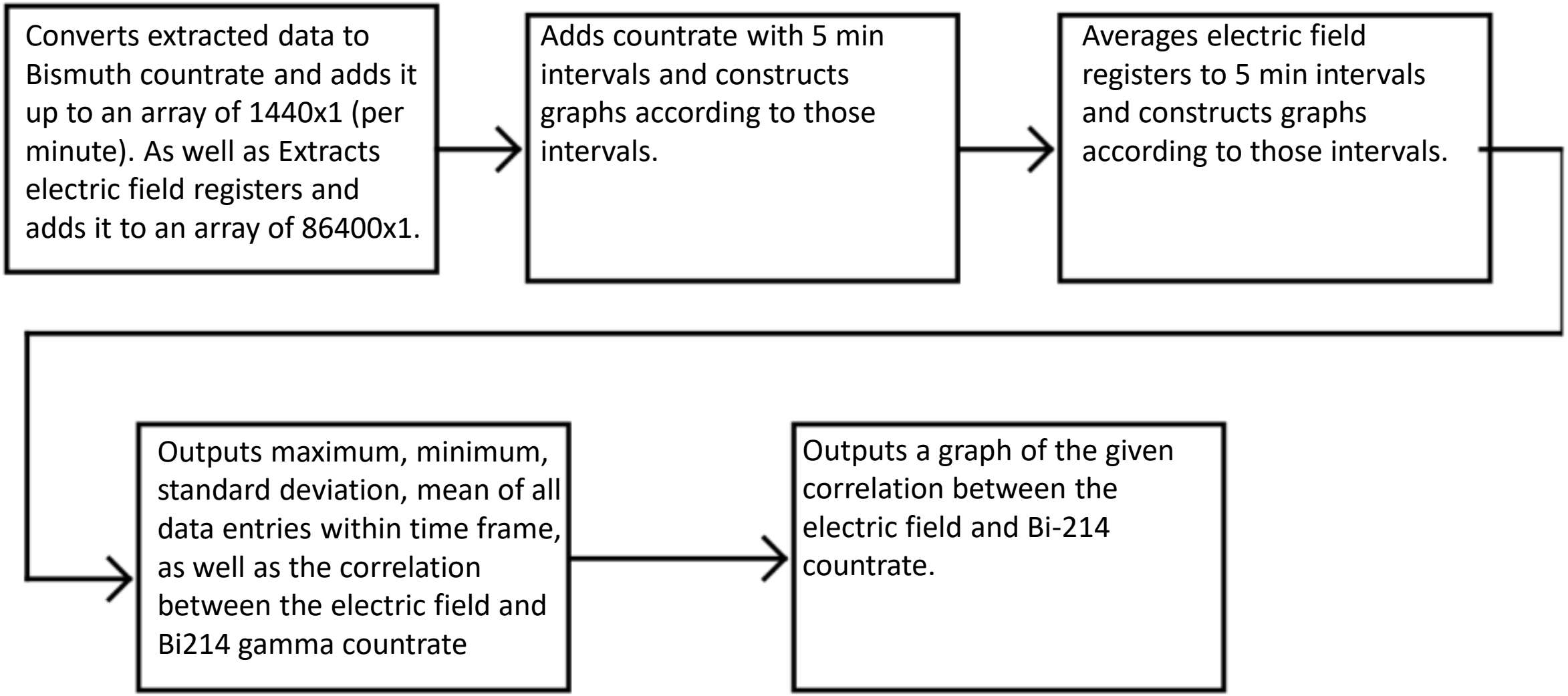
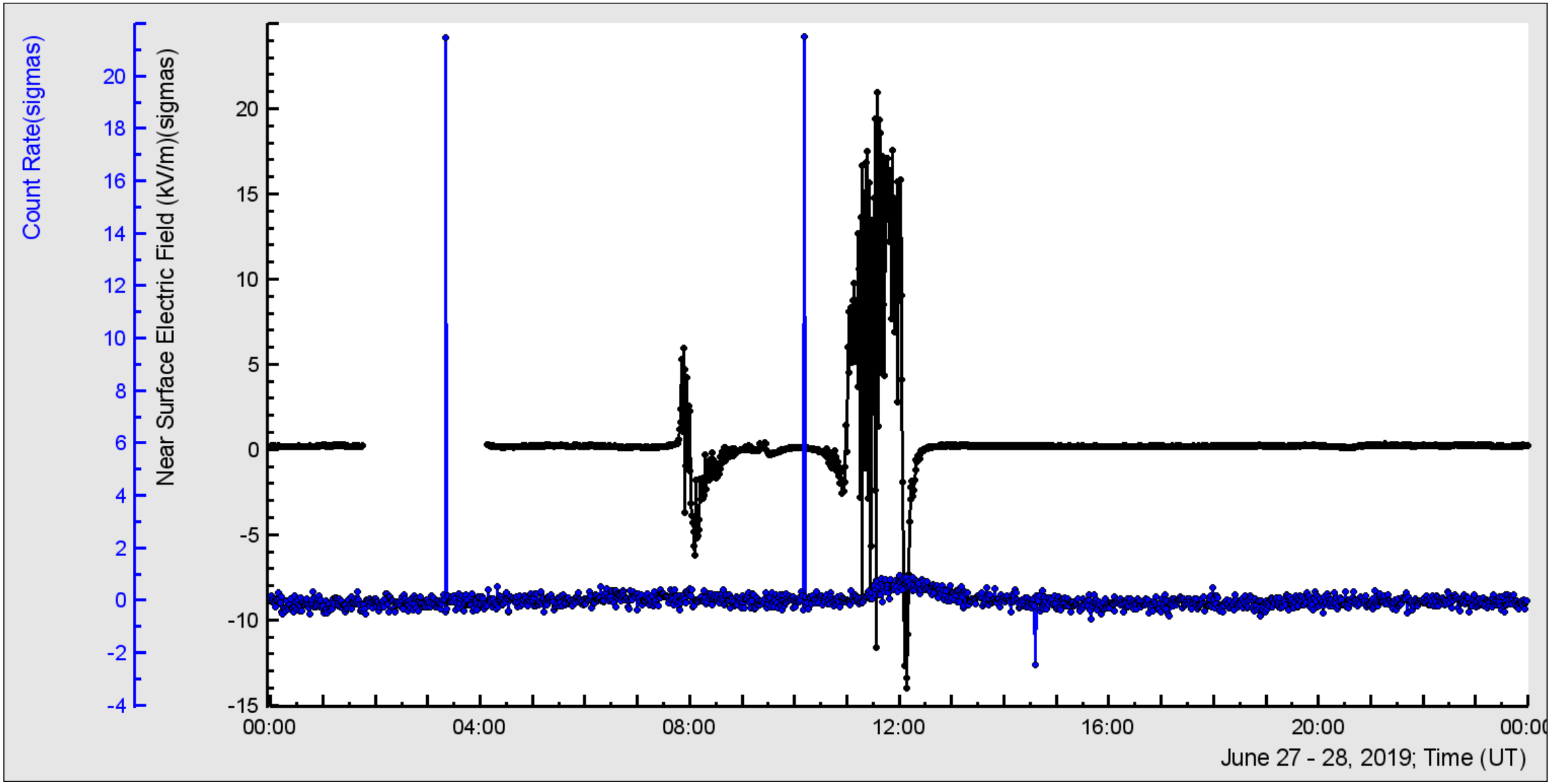
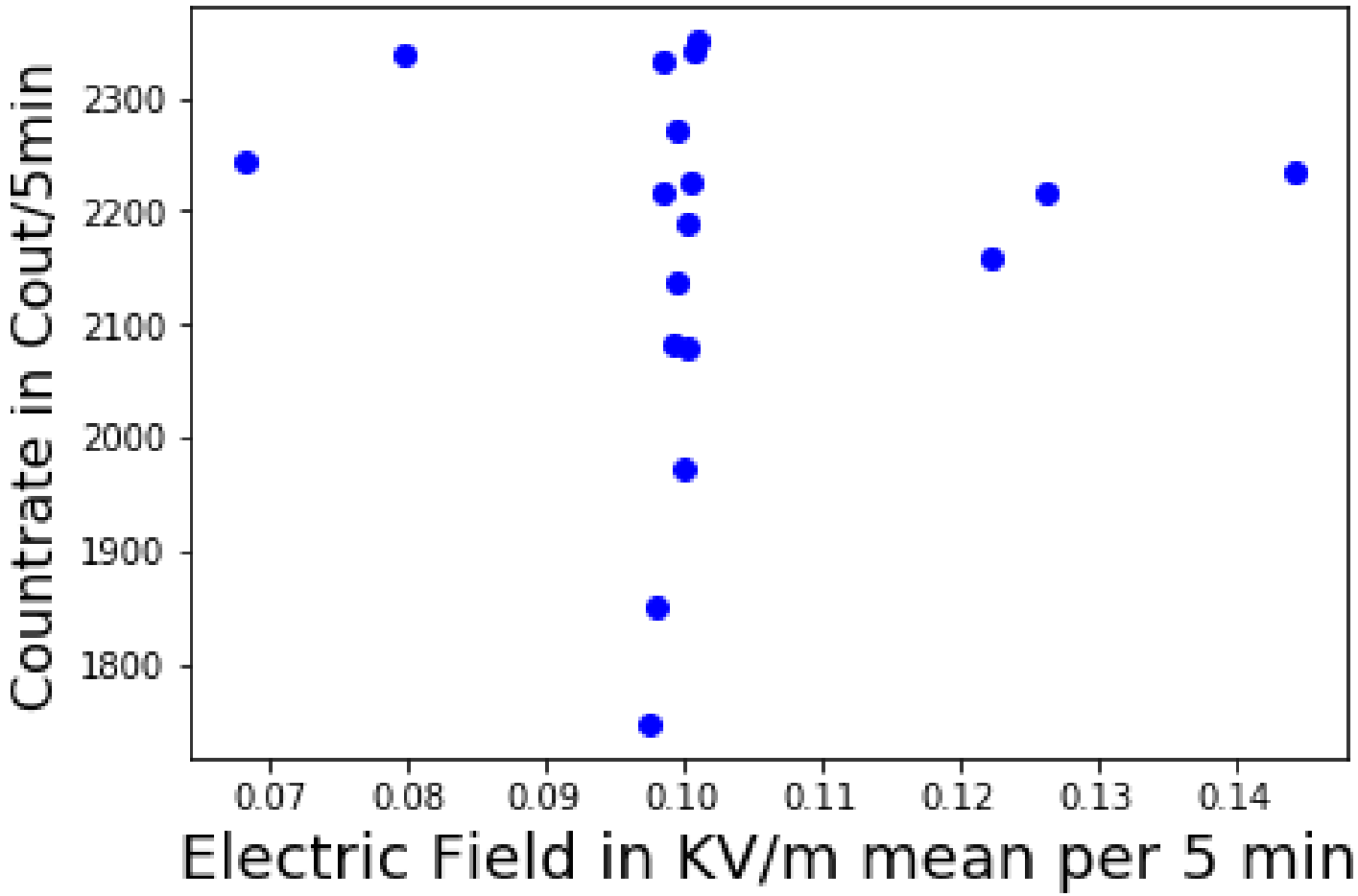
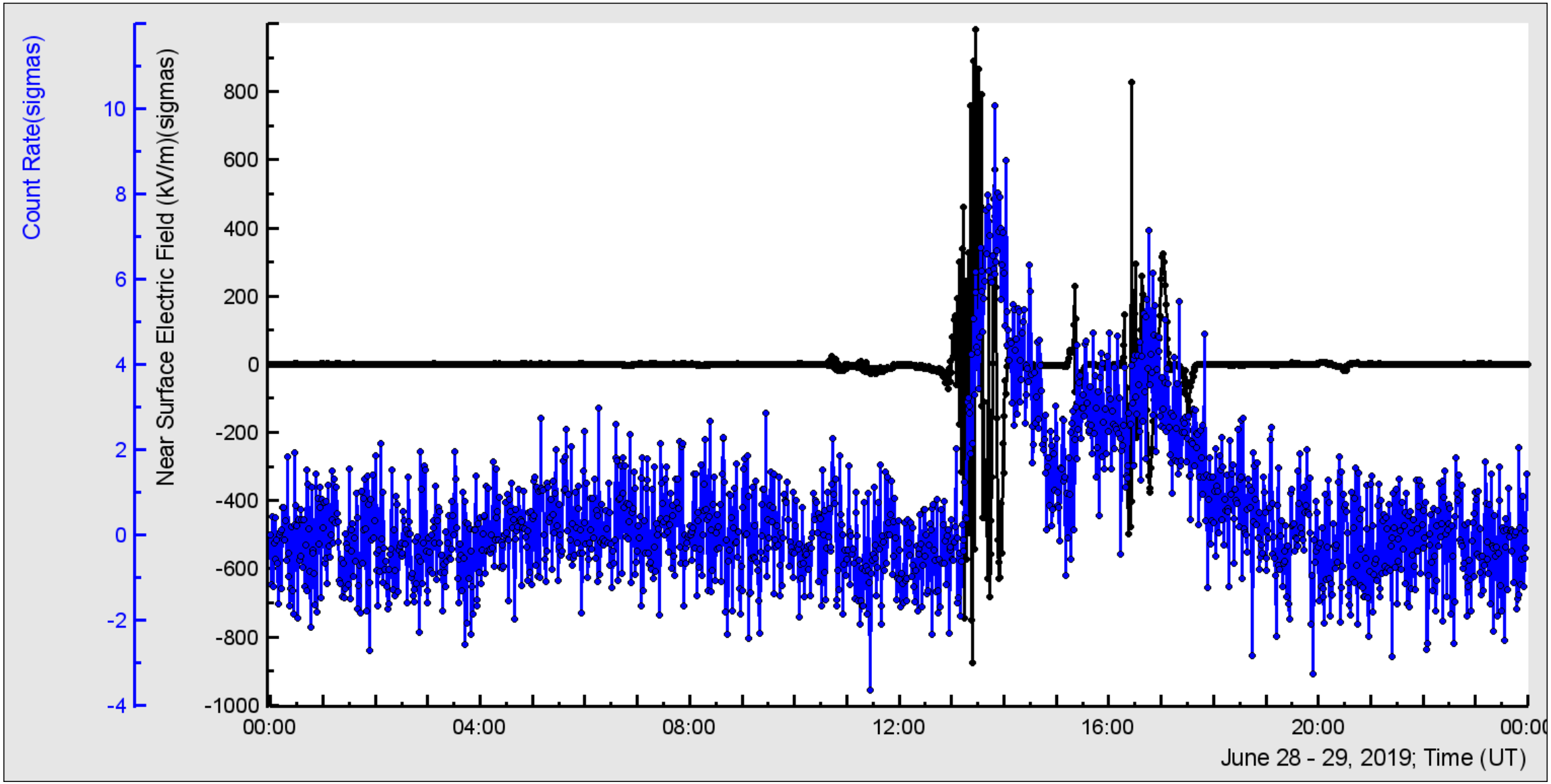

Converts extracted data to Bismuth countrate and adds it up to an array of 1440x1 (per minute). As well as Extracts electric field registers and adds it to an array of 86400x1.
Adds countrate with 5 min intervals and constructs graphs according to those intervals.
Averages electric field registers to 5 min intervals and constructs graphs according to those intervals.
Outputs maximum, minimum, standard deviation, mean of all data entries within time frame, as well as the correlation between the electric field and Bi214 gamma countrate
Outputs a graph of the given correlation between the electric field and Bi-214 countrate.


Count Rate(sigmas)
Near Surface Electric Field (kV/m)(sigmas)
20
18
16
14
12
10
8
6
4
2
0
-2
-4
20
15
10
5
0
-5
-10
-15
00:00
04:00
08:00
12:00
16:00
20:00
00:00
June 27 - 28, 2019; Time (UT)

June 27

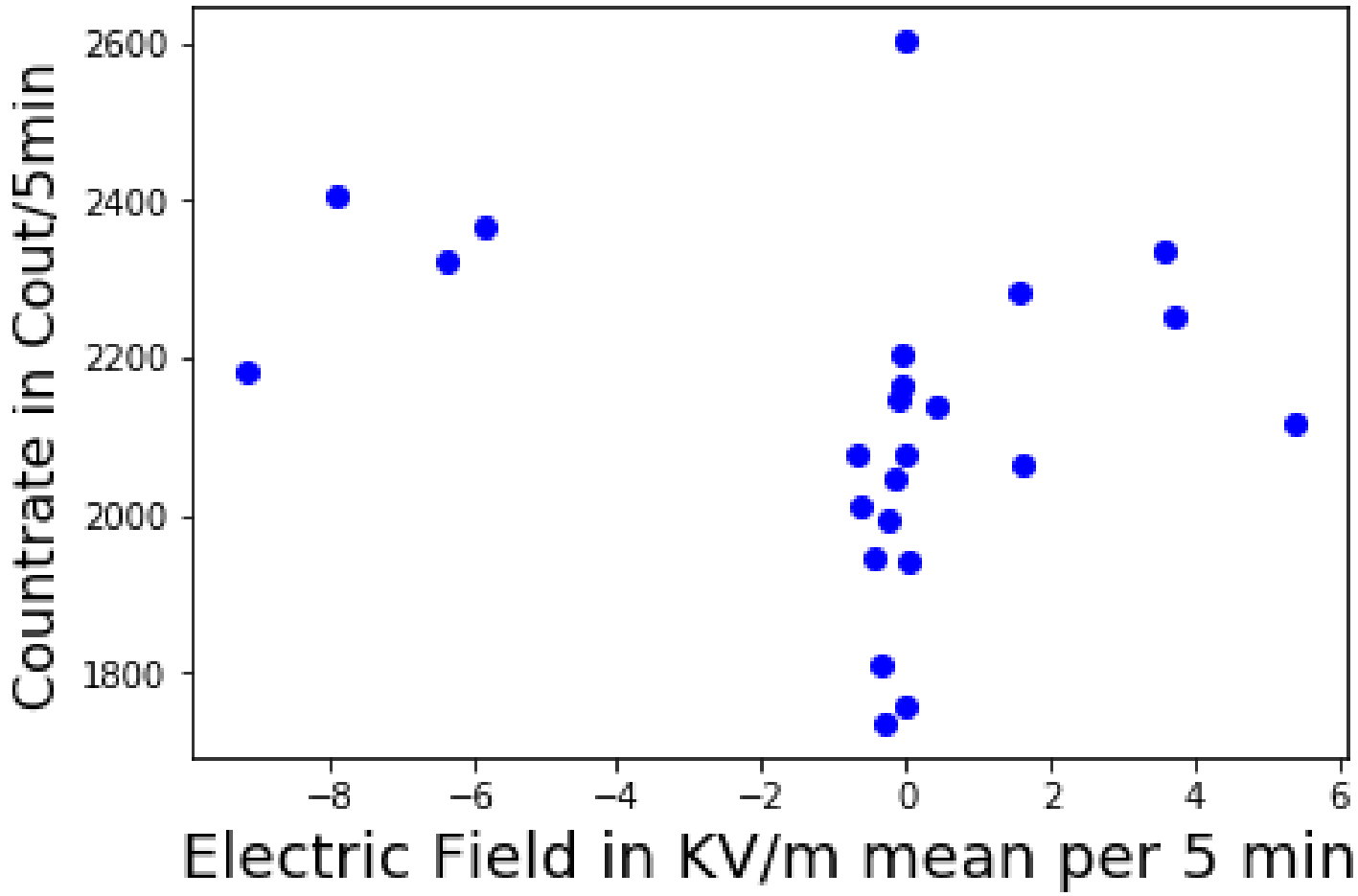
- max= 2350.0
- min= 1747.0
- sigma= 163.25161409974737
- mu= 2165.722222222222
- R=0.0036940217063837 56

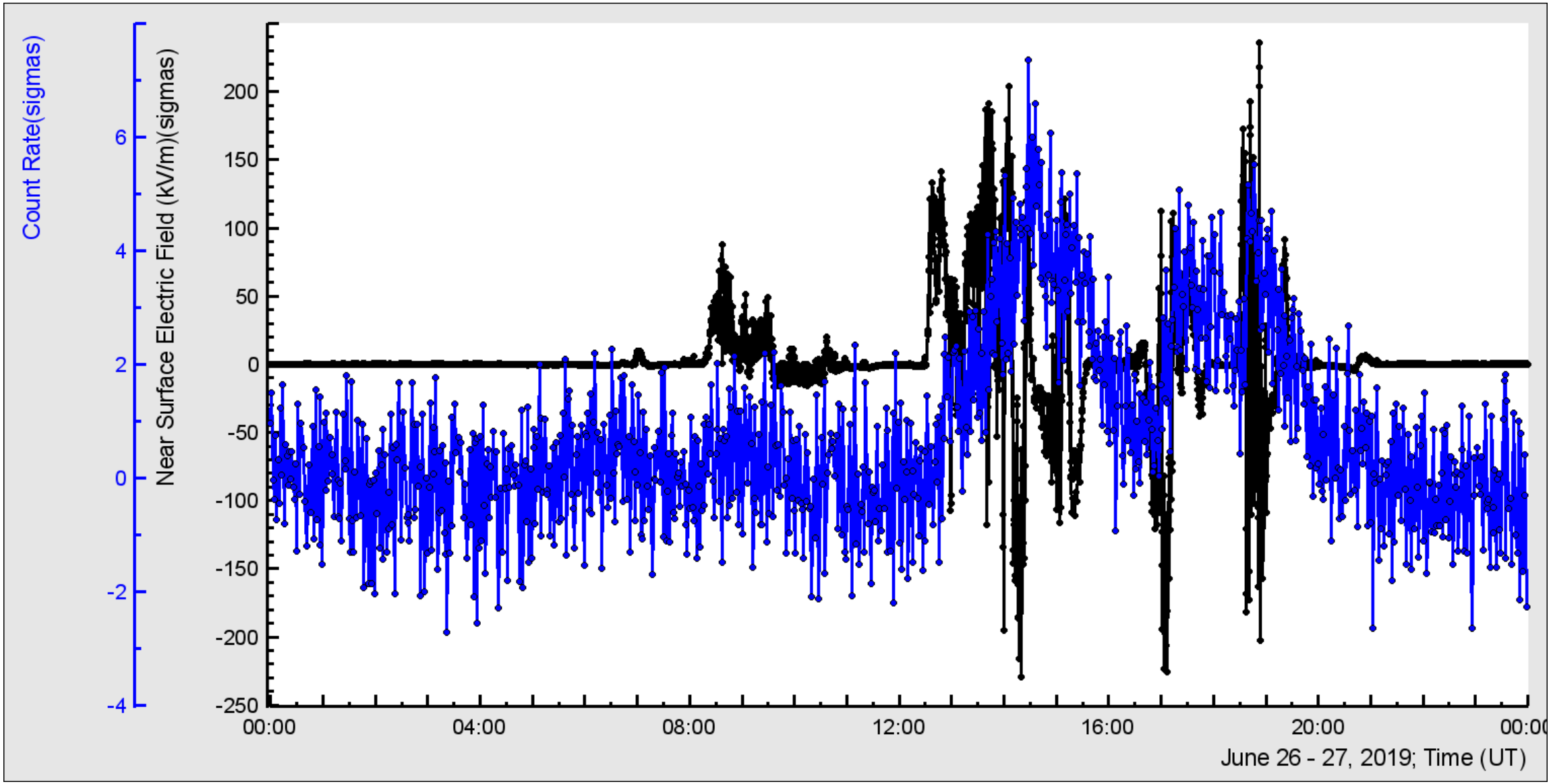



Count Rate(sigmas)
Near Surface Electric Field (kV/m)(sigmas)
10
8
6
4
2
0
-2
-4
800
600
400
200
0
-200
-400
-600
-800
-1000
00:00
04:00
08:00
12:00
16:00
20:00
00:00
June 28 - 29, 2019; Time (UT)

June 28

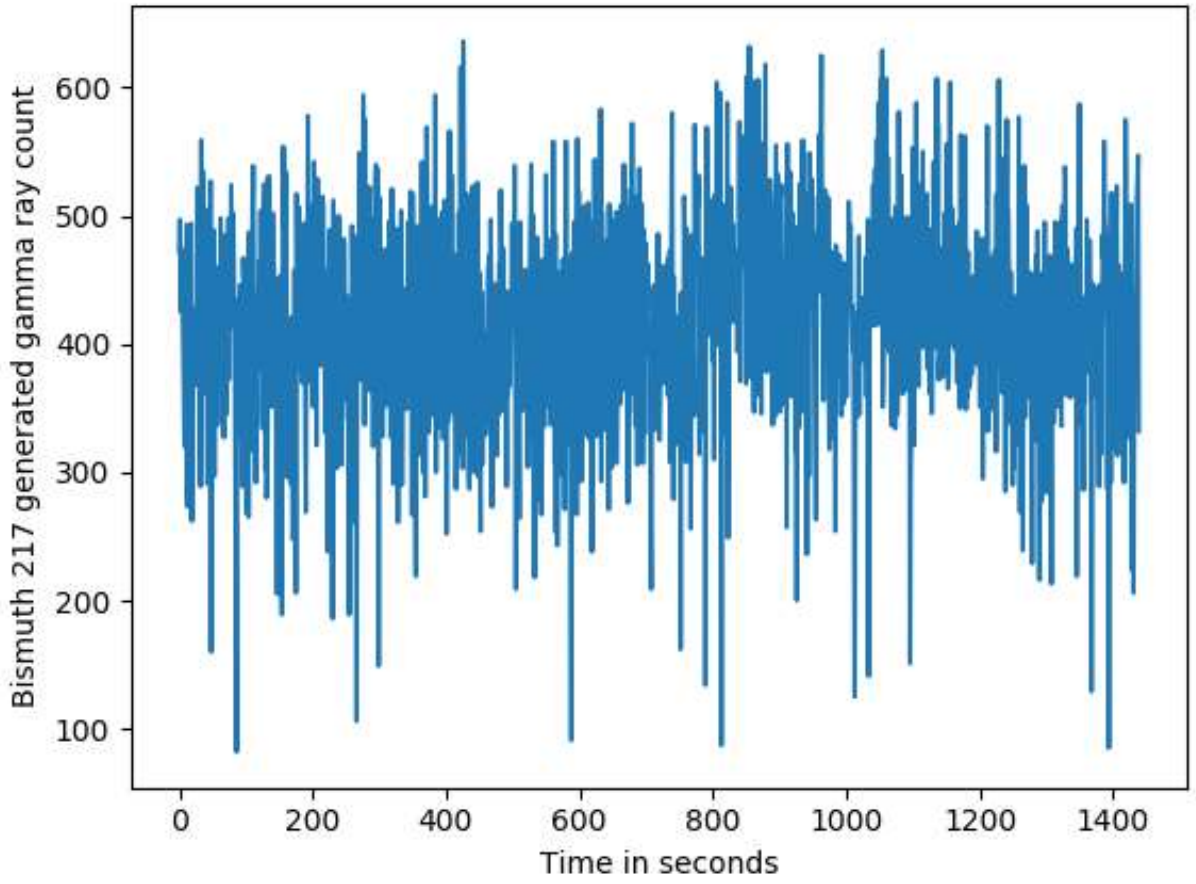
- max= 2605.0
- min= 1736.0
- sigma= 209.93907433004358
- mu= 2187.7916666666665
- R=-0.22338253313344136

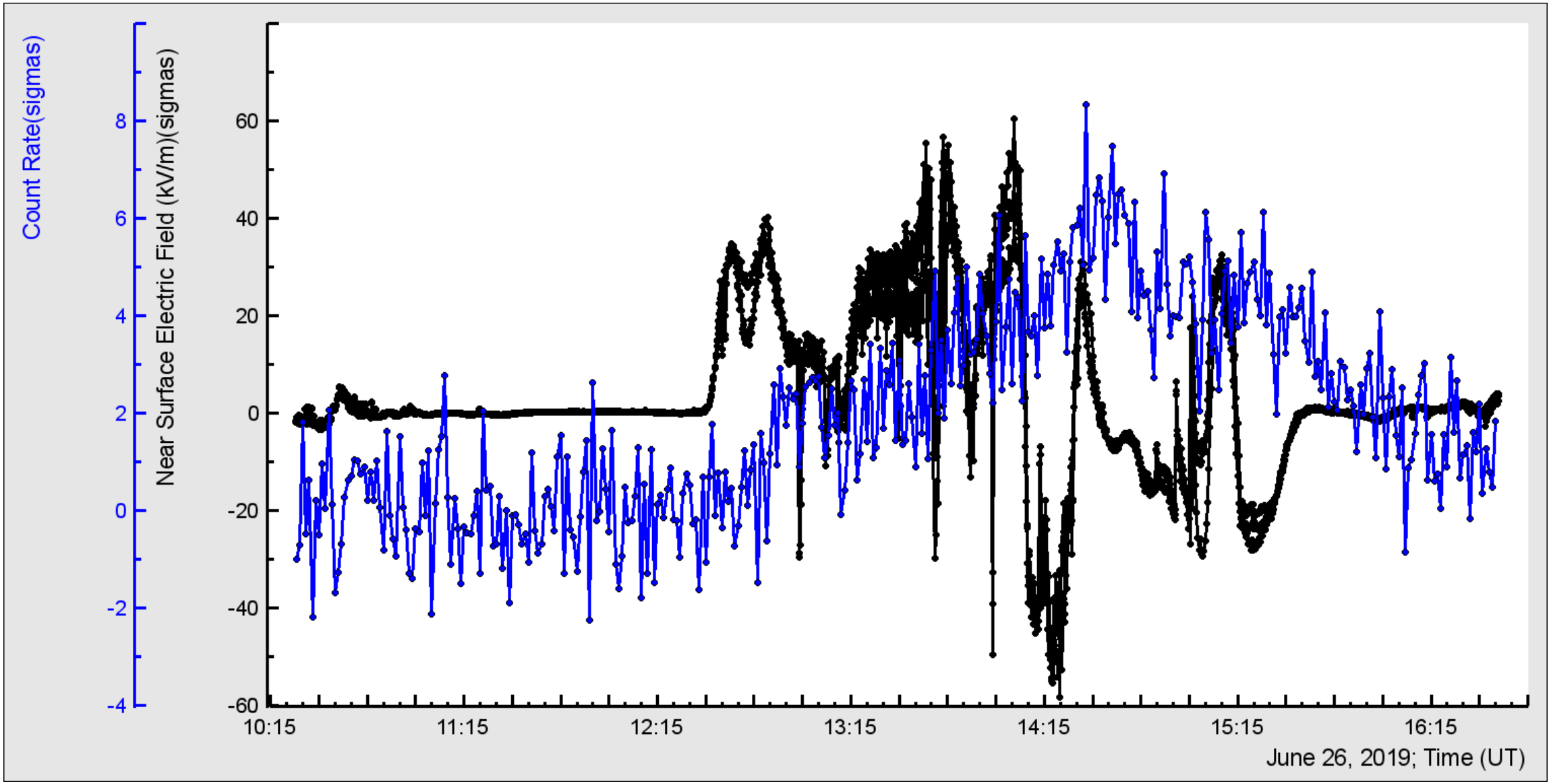


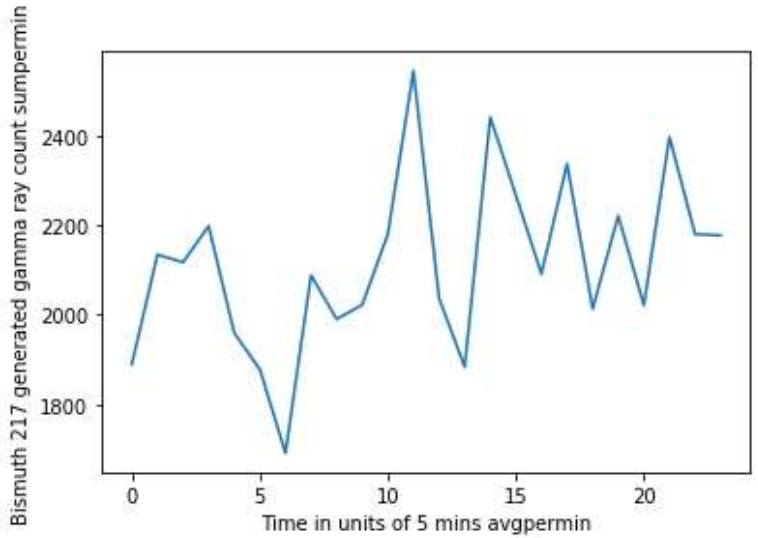

Count Rate(sigmas)
Near Surface Electric Field (kV/m)(sigmas)
6
4
2
0
-2
-4
200
150
100
50
0
-50
-100
-150
-200
-250
00:00
04:00
08:00
12:00
16:00
20:00
00:00
June 26 - 27, 2019; Time (UT)

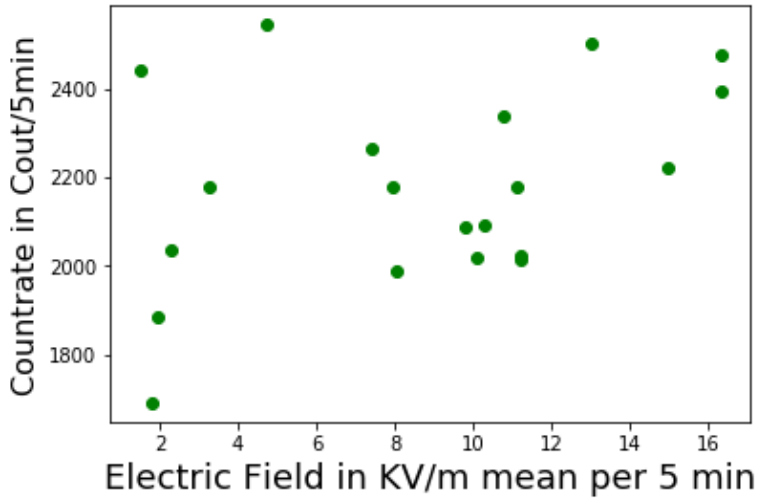
June 26

- max= 636.0
- min= 82.0
- sigma= 81.83283546984029
- mu= 416.66527777777776



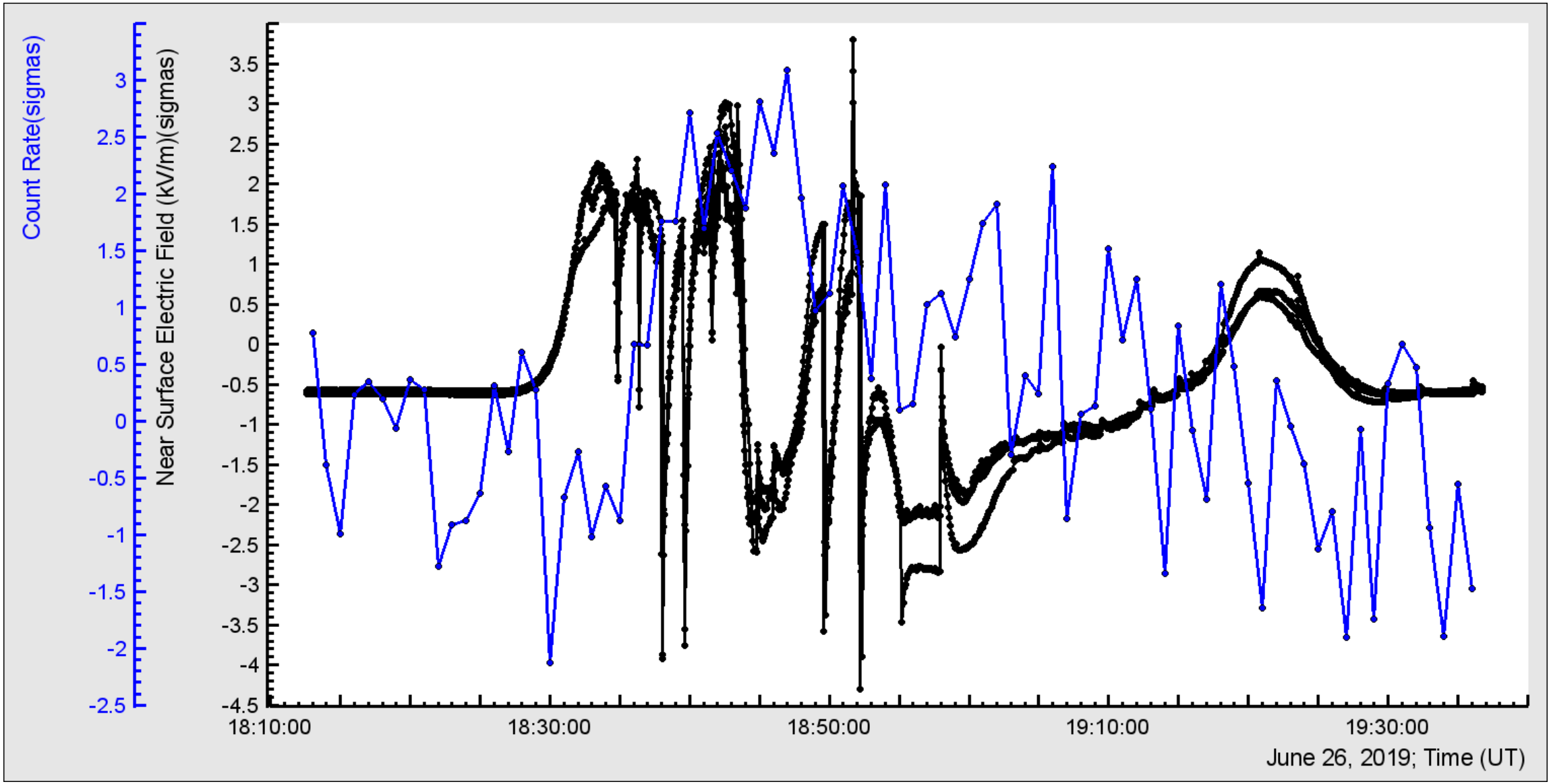

Count Rate(sigmas)
Near Surface Electric Field (kV/m)(sigmas)
8
6
4
2
0
-2
-4
60
40
20
0
-20
-40
-60
10:15
11:15
12:15
13:15
14:15
15:15
16:15
June 26, 2019; Time (UT)

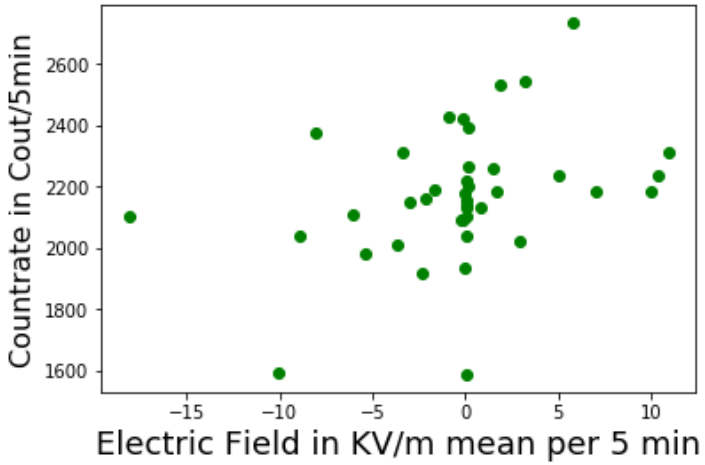


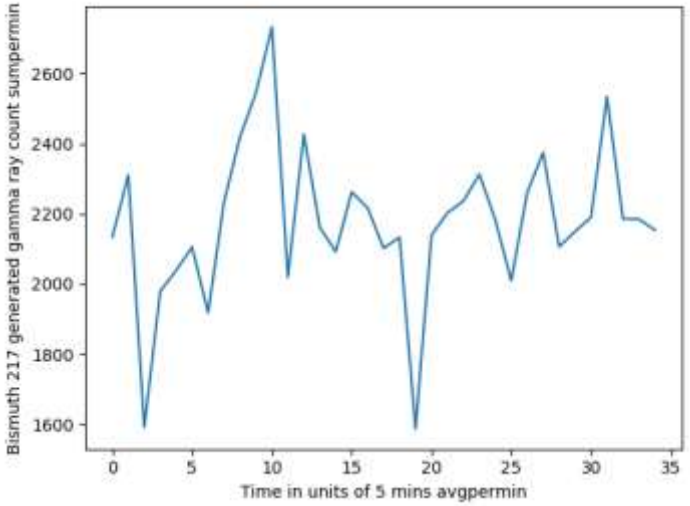


First Event:

- max= 2545.0
- min= 1691.0
- sigma= 192.56550112162412
- mu= 2114.8333333333335
- R=0.3735215645995485
  time (150→170)

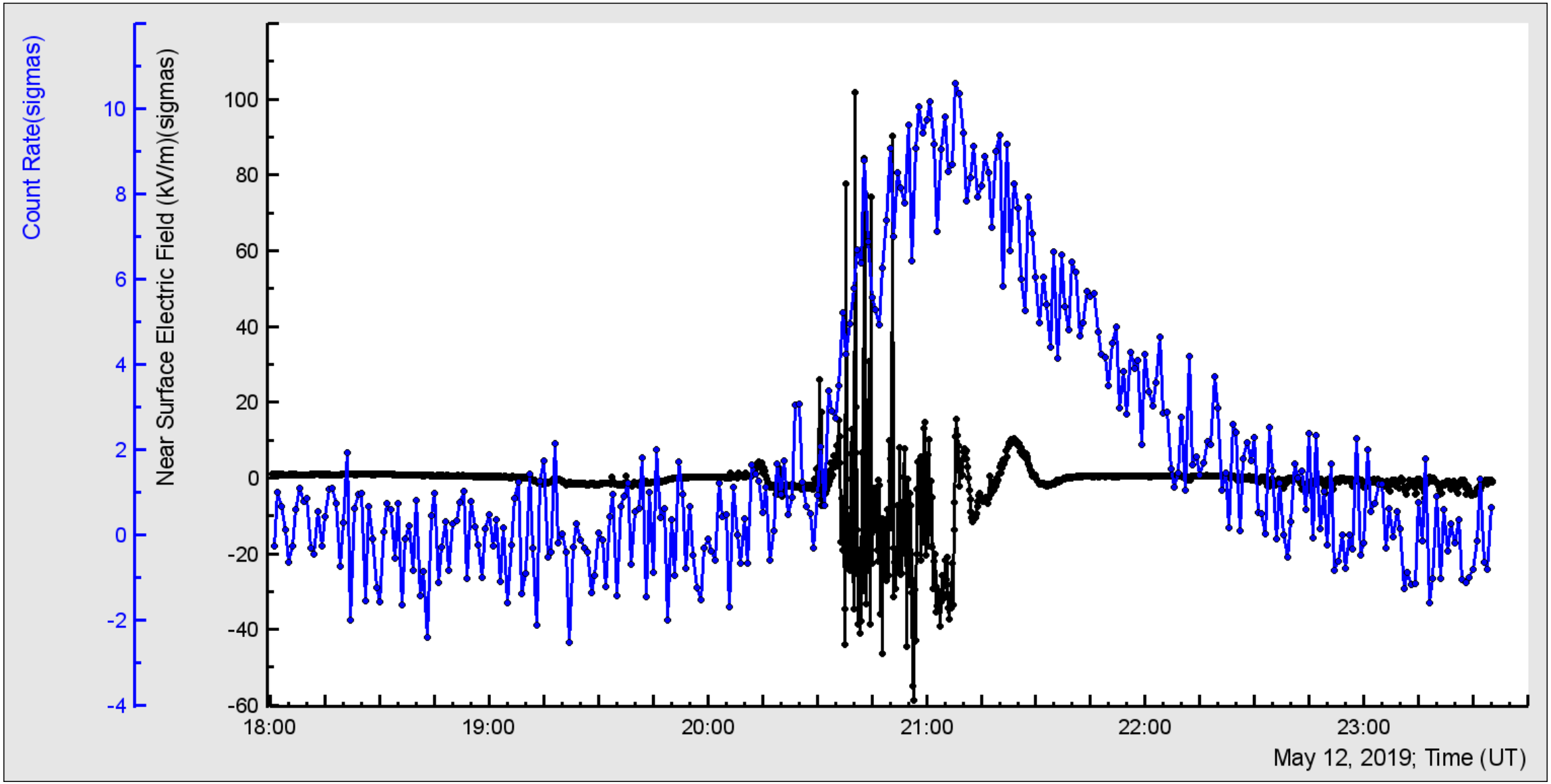

Count Rate(sigmas)
Near Surface Electric Field (kV/m)(sigmas)
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
3.5
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
-3.5
-4
-4.5
18:10:00
18:30:00
18:50:00
19:10:00
19:30:00
June 26, 2019; Time (UT)

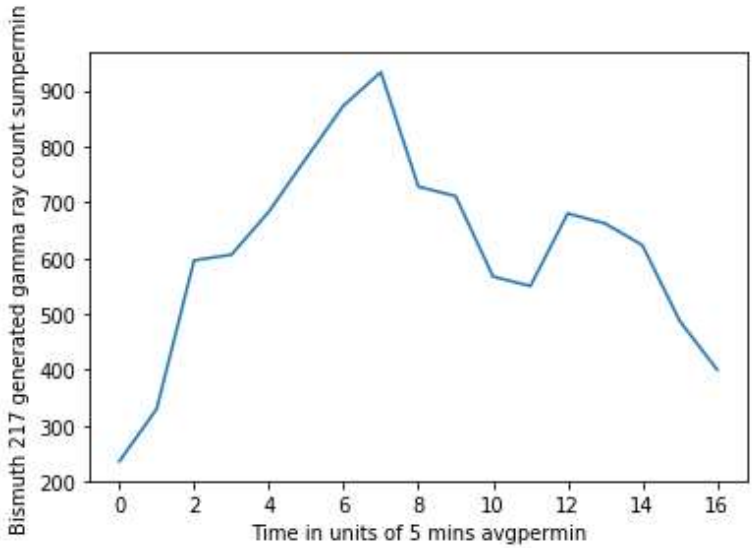


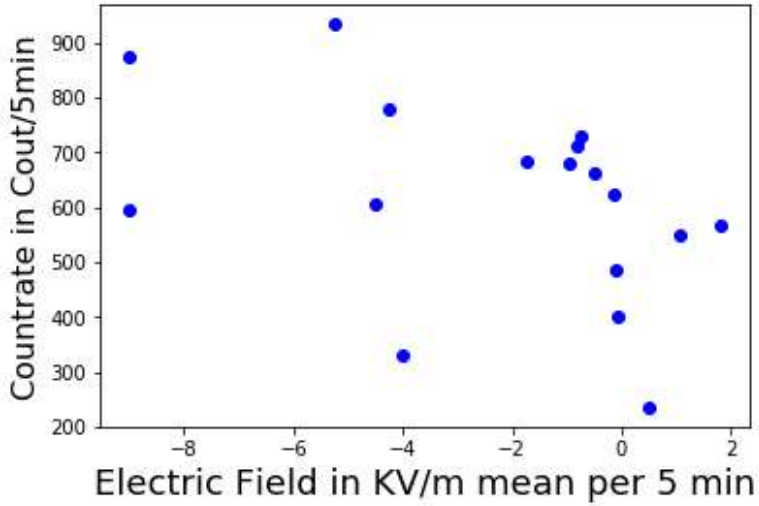


Second Event

- max= 2733.0
- min= 1587.0
- sigma= 219.86273268676027
- mu= 2178.0857142857144
- R=0.35182705596045294
  (time :200→240)

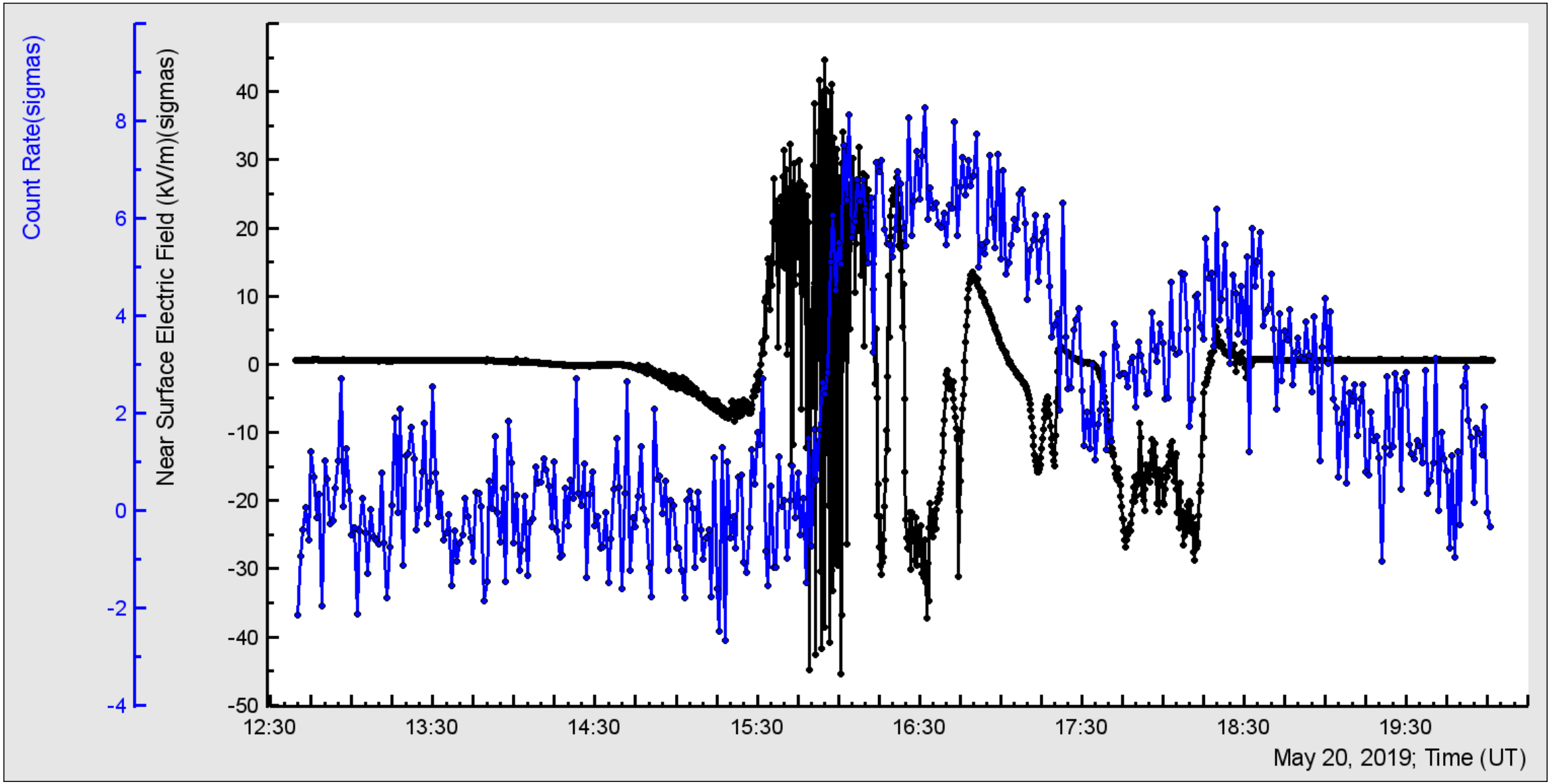

Count Rate(sigmas)
Near Surface Electric Field (kV/m)(sigmas)
10
8
6
4
2
0
-2
-4
100
80
60
40
20
0
-20
-40
-60
18:00
19:00
20:00
21:00
22:00
23:00
May 12, 2019; Time (UT)

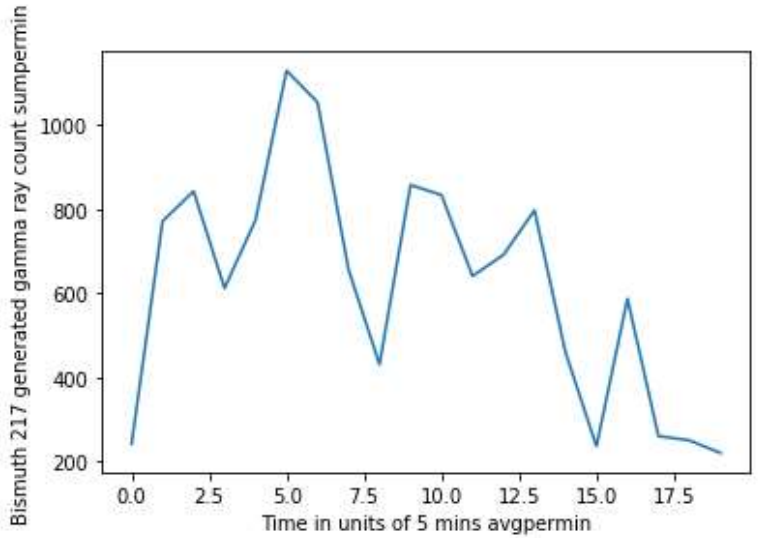


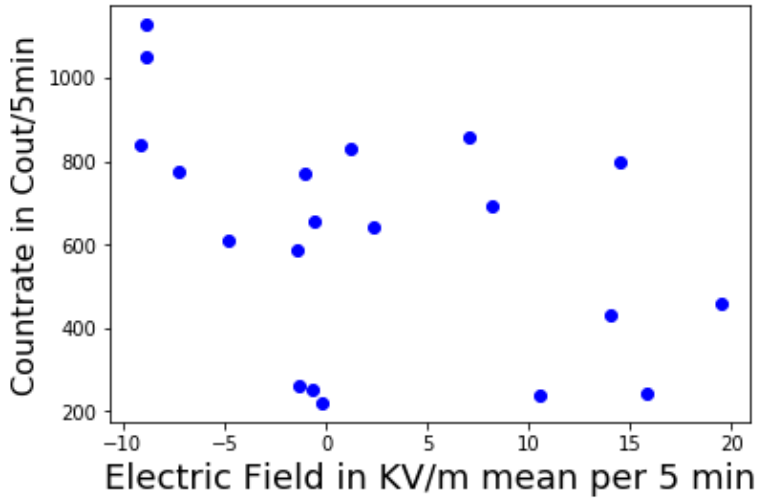


May 12

- max= 933
- min= 236
- sigma= 175.25273889828222
- mu= 614.3529411764706
- R=-0.4288916989468448

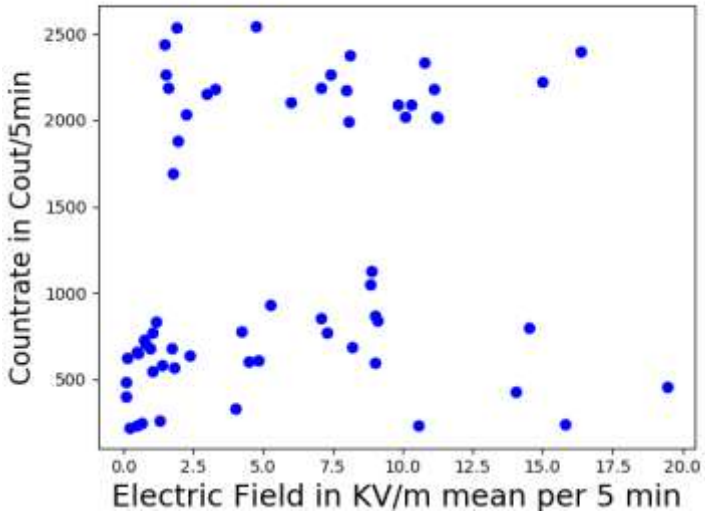

Count Rate(sigmas)
Near Surface Electric Field (kV/m)(sigmas)
8
6
4
2
0
-2
-4
40
30
20
10
0
-10
-20
-30
-40
-50
12:30
13:30
14:30
15:30
16:30
17:30
18:30
19:30
May 20, 2019; Time (UT)

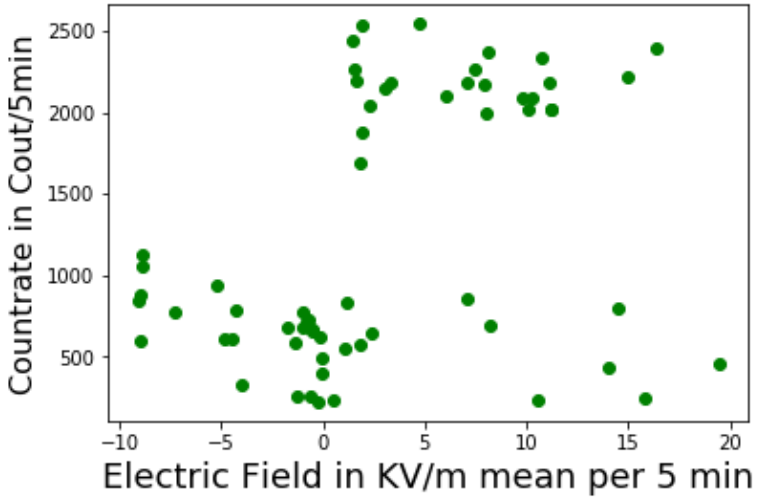




May 20

- max= 1128
- min= 221
- sigma= 269.85071799052156
- mu= 617.3
- R=-0.4598168827237273





All of my June events with absolute values for electric fields

- R1=0.21705792851498004
- R2=0.3816453508610712
- max= 2545.0
- min= 1691.0
- sigma= 176.44765807929178
- mu= 2167.875

Conclusions:

- Correlations between countrates generated by Radon-222 progenies give us a certain number, although not high but nonetheless it exists.
- Count rates behave similarly in negative electric fields and positive electric fields, which determines that our particles attach themselves to positive and negative aerosol molecules.