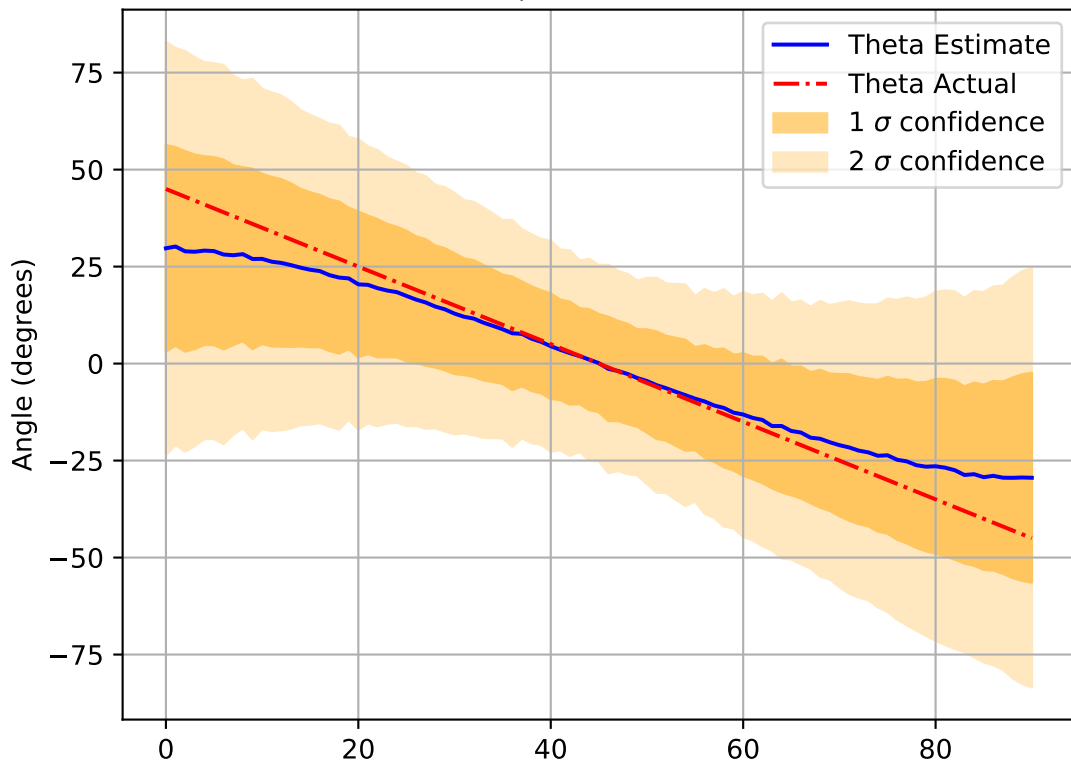E = 1000 keV, N = 10000 particles

```
Pinhole radius: 1.500000 mm
Gap between window and detector: 31.500000 mm
Window thickness: 1000.000000 um
Shielding foil thickness: 10.000000 um
--------------------------------
Theta Angle (degrees), Standard deviation (degrees):
 0      26.6007
1      25.5517
2      25.7862
3      25.0261
4      24.2643
5      24.1829
6      24.4072
7      23.1298
8      22.3637
9      23.2067
10     21.8898
11     21.7971
12     21.5273
13     21.0321
14     20.2695
15     19.9248
16     19.5631
17     19.5080
18     19.5574
19     18.1840
20     18.6967
21     17.8111
22     17.7736
23     17.1396
24     16.7864
25     16.7575
26     16.2594
27     16.2622
28     15.6538
29     15.7162
         ...
61     15.7480
62     16.2435
63     16.0112
64     17.0694
65     16.5264
66     16.9662
67     16.8213
68     17.7314
69     17.6524
70     18.2737
71     18.8158
72     18.9097
73     19.0149
74     19.4921
75     20.1542
76     20.5608
77     21.0937
78     21.2847
79     21.7646
80     22.4734
81     22.8254
82     23.0160
```
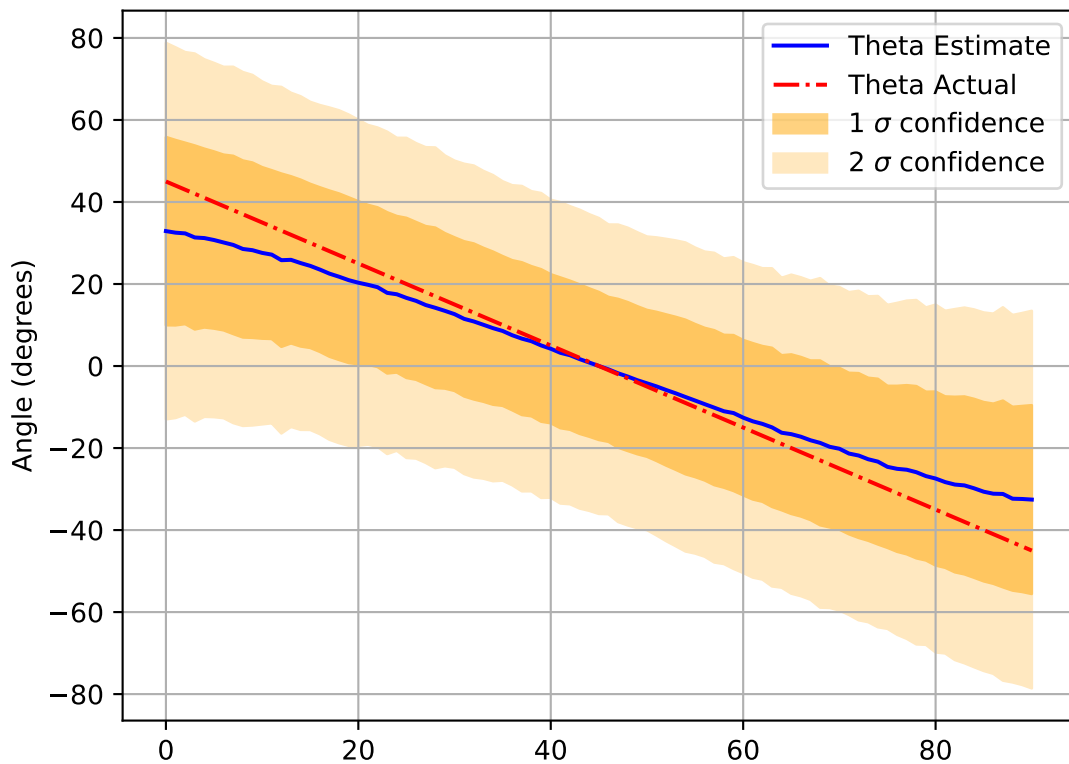
```
83      22.7743
84      23.5610
85      23.8241
86      24.3814
87      24.7246
88      25.7890
89      26.5716
90      27.0059
Name: Theta_std, Length: 91, dtype: float64
```

```
Pinhole radius: 1.500000 mm
Gap between window and detector: 31.500000 mm
Window thickness: 1000.000000 um
Shielding foil thickness: 10.000000 um
--------------------------------
Theta Angle (degrees), Standard deviation (degrees):
 0      22.9443
1       22.5881
2       22.0977
3       22.4172
4       21.7842
5       21.5865
6       21.4086
7       21.7126
8       21.5635
9       21.3574
10      20.8980
11      20.5565
12      21.1174
13      20.3605
14      20.3261
15      19.9934
16      20.0529
17      20.2449
18      20.2818
19      20.1841
20      19.8668
21      19.4793
22      19.4581
23      19.6409
24      19.0672
25      19.5047
26      19.2199
27      19.2344
28      19.5399
29      18.9357
          ...
61      19.0464
62      18.9697
63      19.3849
64      18.8819
65      19.4378
66      19.4289
67      19.4369
68      20.0784
69      19.6391
70      19.7059
71      19.6708
72      20.0745
73      19.8546
74      20.1830
75      19.7399
76      20.2209
77      20.6060
78      20.9841
79      20.5585
80      21.1941
81      20.8796
82      21.3819
```
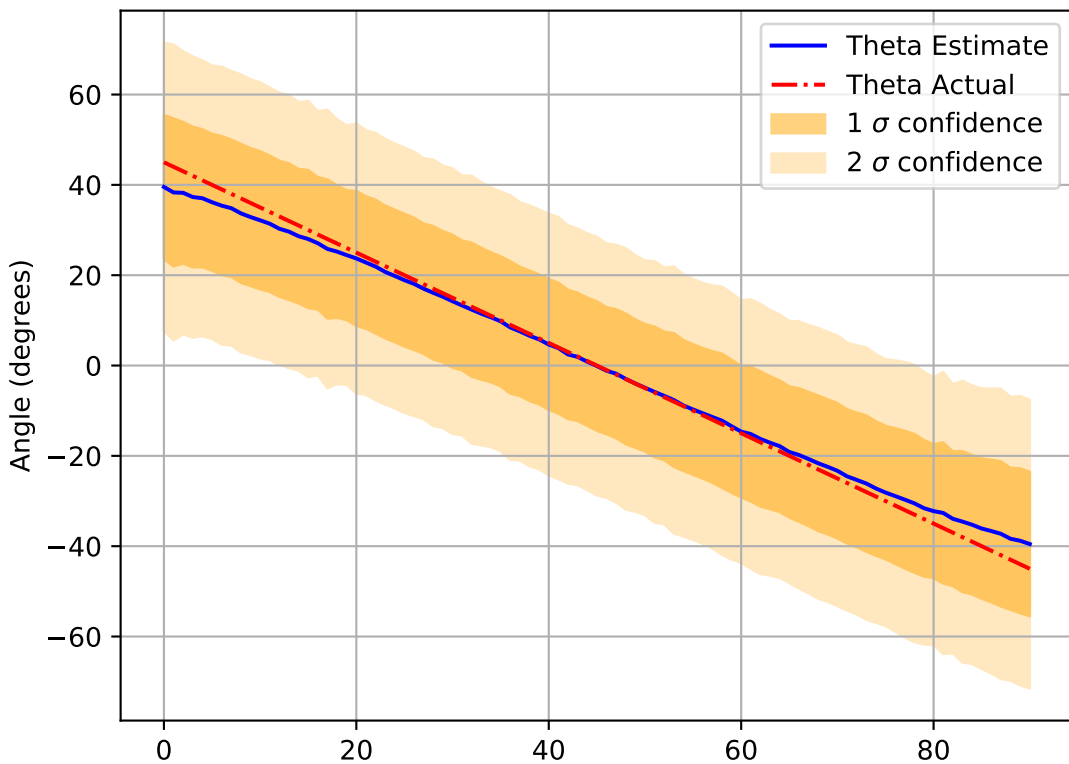
```
83     21.6740
84     21.7997
85     21.8462
86     21.9449
87     22.7521
88     22.3892
89     22.6641
90     23.0086
Name: Theta_std, Length: 91, dtype: float64
```

E = 5000 keV, N = 10000 particles

Legend:
- Theta Estimate
- Theta Actual
- 1 σ confidence
- 2 σ confidence

Angle (degrees)

```
Pinhole radius: 1.500000 mm
Gap between window and detector: 31.500000 mm
Window thickness: 1000.000000 um
Shielding foil thickness: 10.000000 um
--------------------------------
Theta Angle (degrees), Standard deviation (degrees):
 0      15.9468
 1      16.3583
 2      15.6576
 3      15.5522
 4      15.2503
 5      15.1170
 6      15.3726
 7      15.1666
 8      15.3704
 9      15.2351
10      15.2648
11      15.0584
12      15.0334
13      15.0898
14      14.8486
15      15.2647
16      14.6069
17      15.3869
18      14.6435
19      14.3302
20      14.9274
21      14.6275
22      14.7779
23      14.6850
24      14.6435
25      14.6776
26      14.6135
27      14.4245
28      14.7333
29      14.5020
         ...
61      14.9012
62      14.9436
63      14.6957
64      14.5612
65      14.4957
66      14.7655
67      14.8281
68      14.9742
69      14.9230
70      14.9679
71      14.8178
72      14.8815
73      15.0622
74      14.8495
75      14.7528
76      14.9938
77      15.2307
78      15.3332
79      15.0837
80      14.7998
81      15.5991
82      14.8705
```

```
83      15.5771
84      15.4021
85      15.5107
86      15.7529
87      16.0501
88      15.6832
89      16.0030
90      15.9702
Name: Theta_std, Length: 91, dtype: float64
```