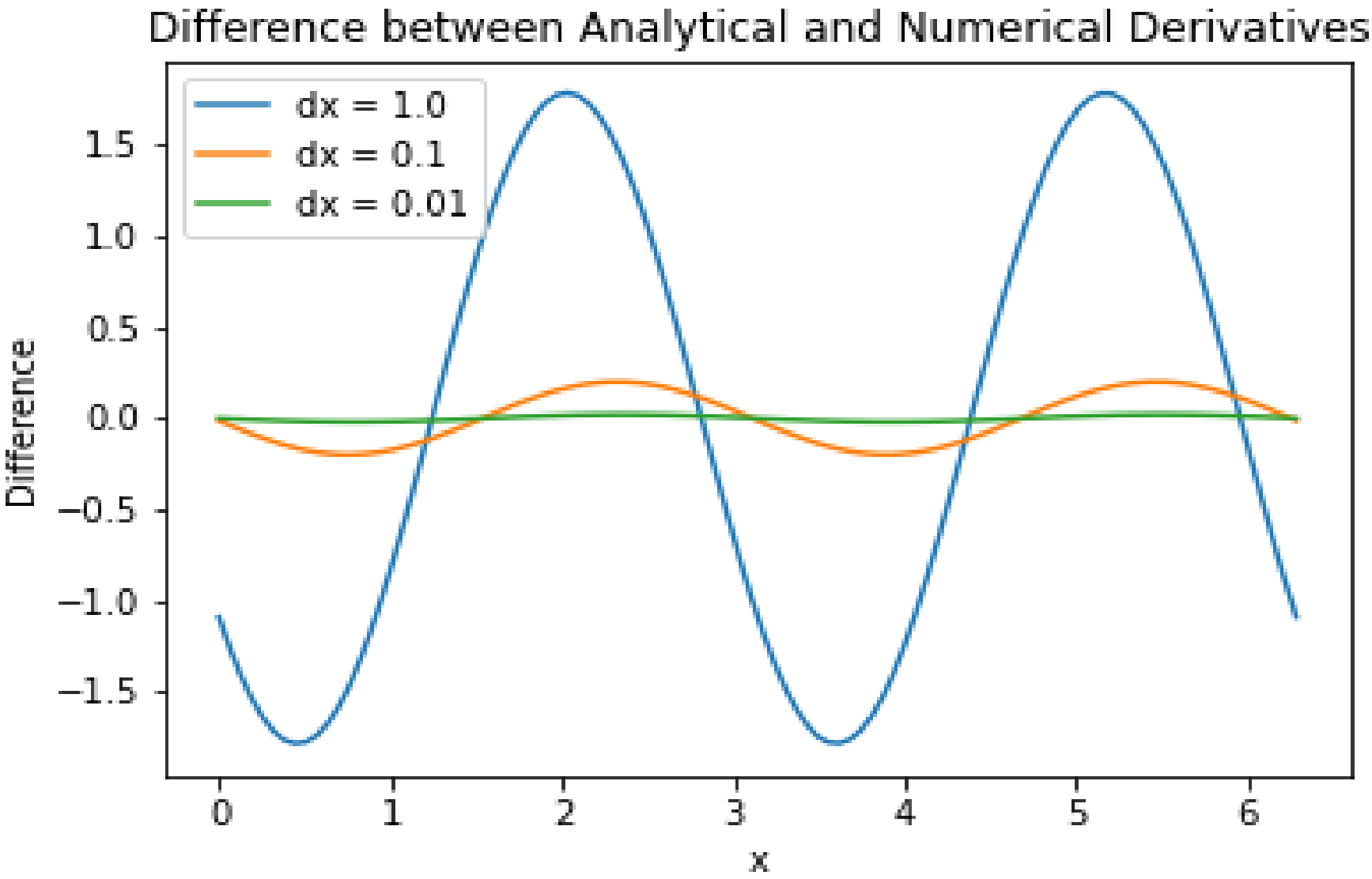
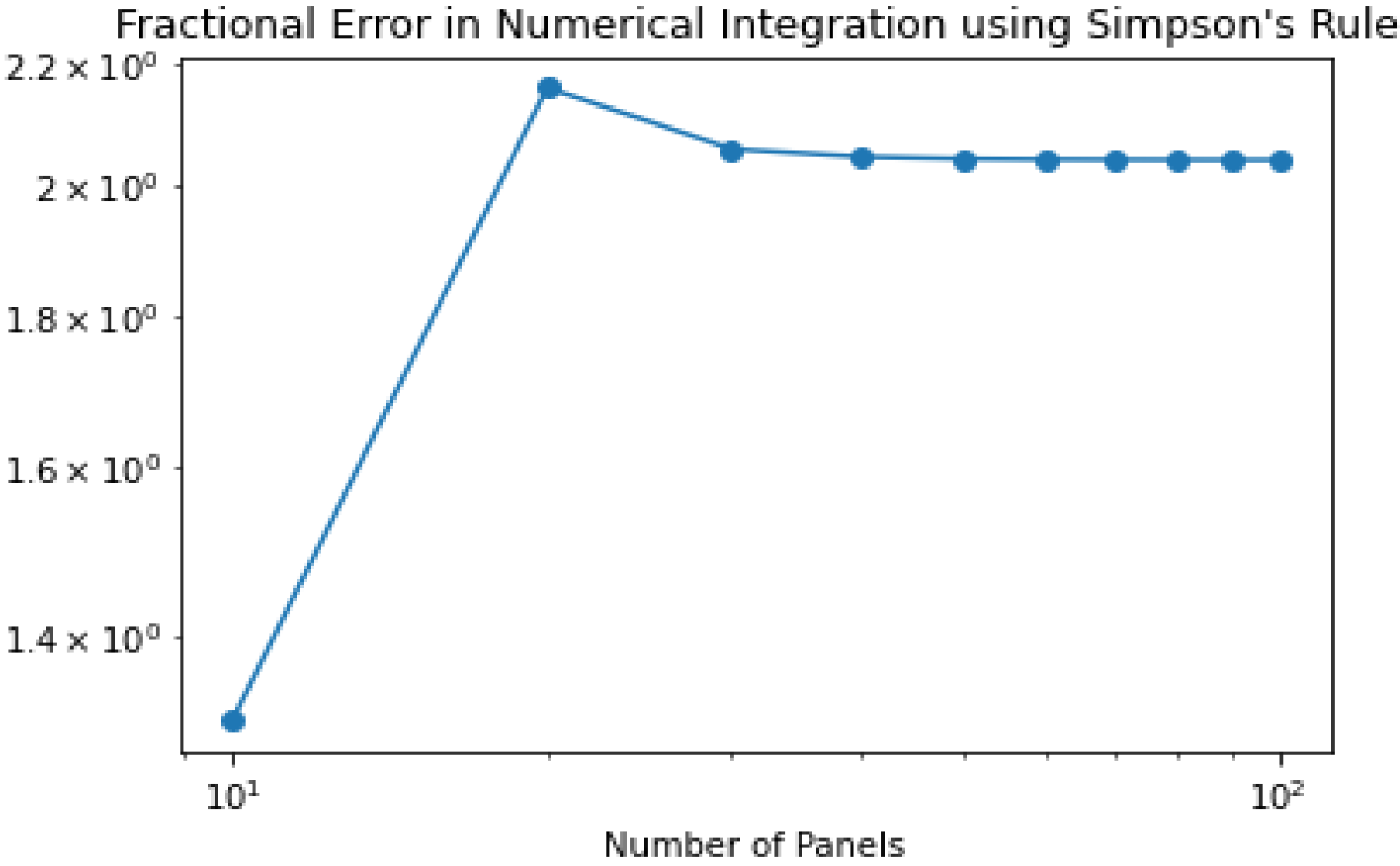
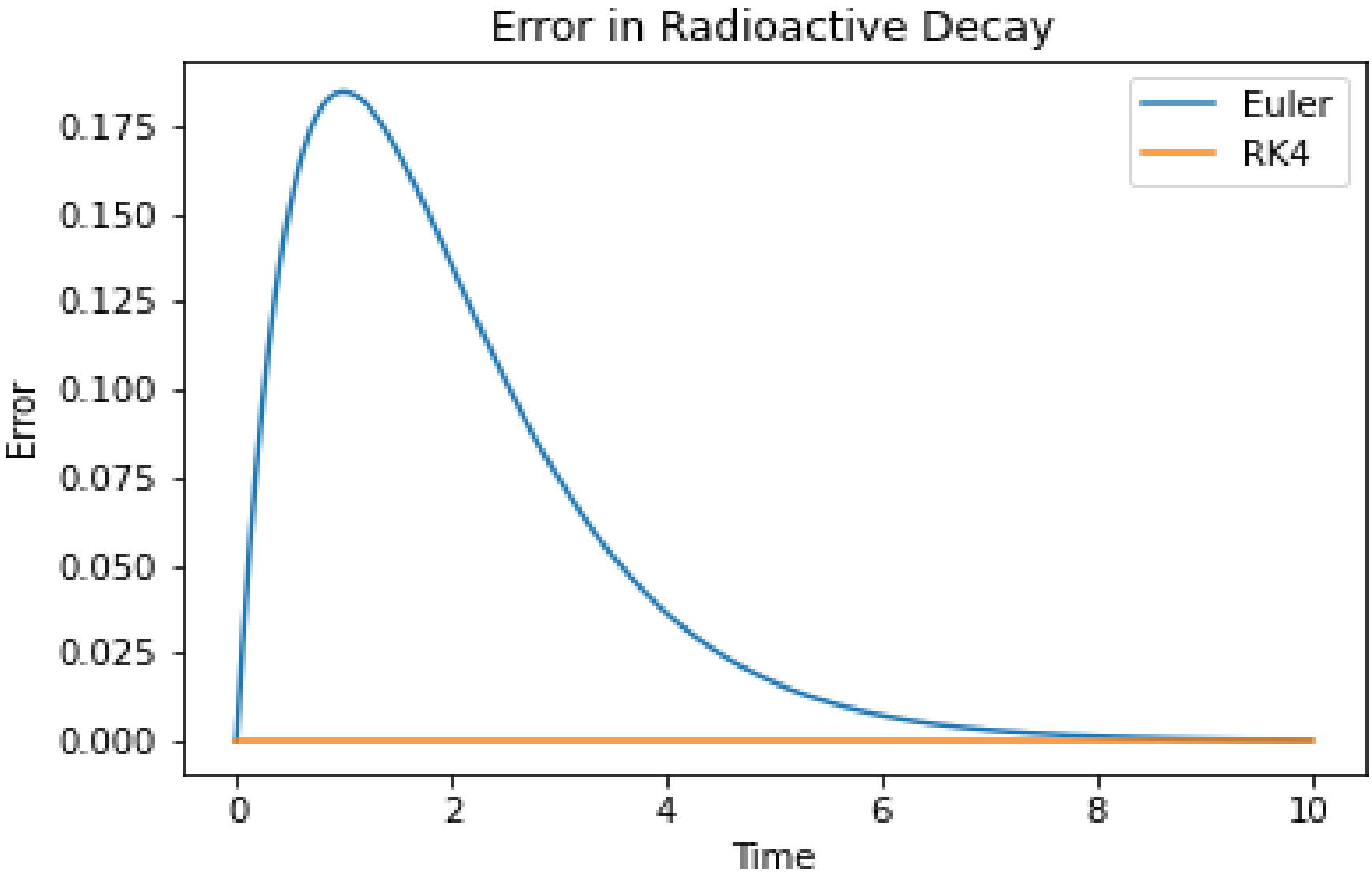
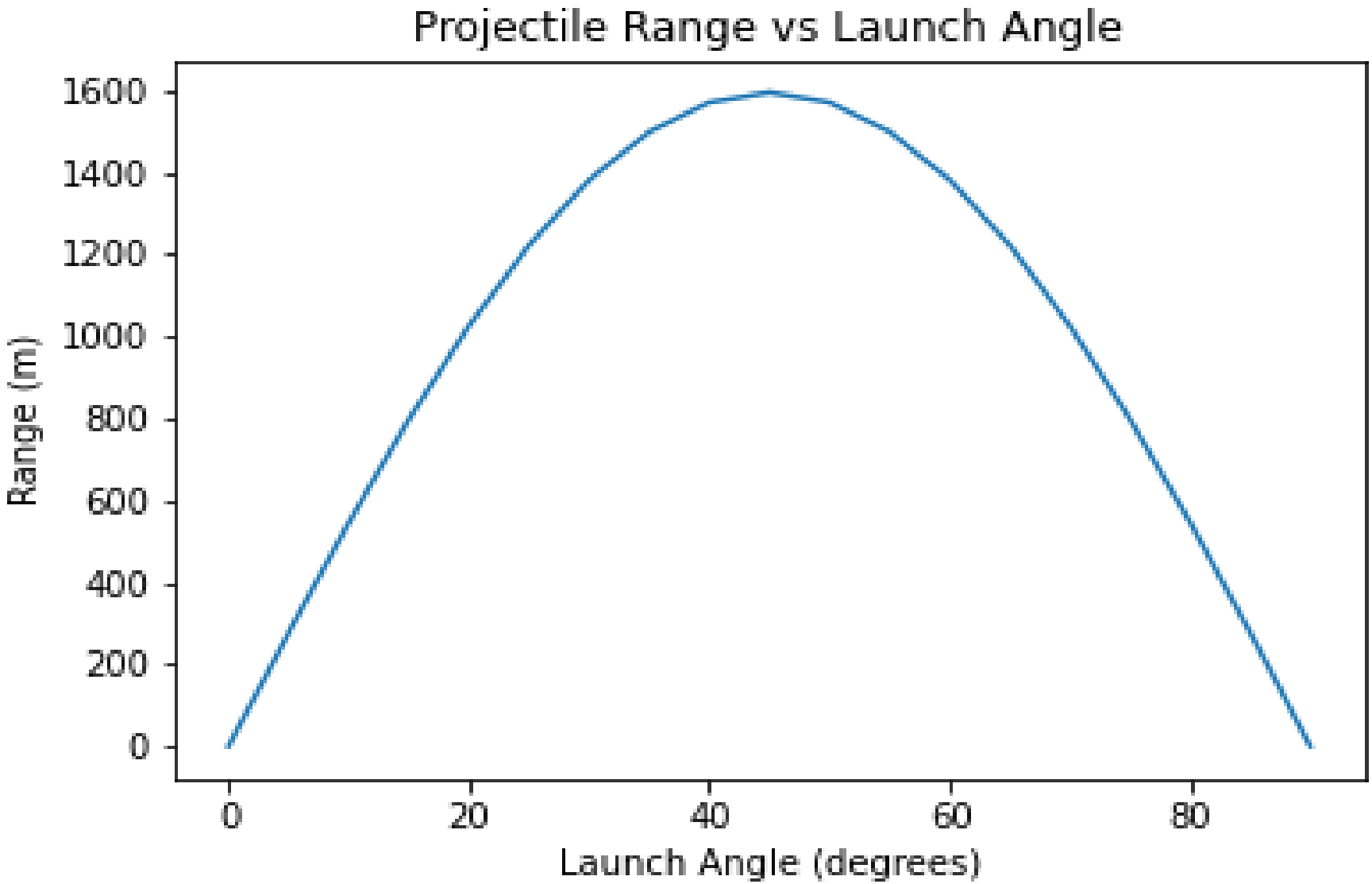
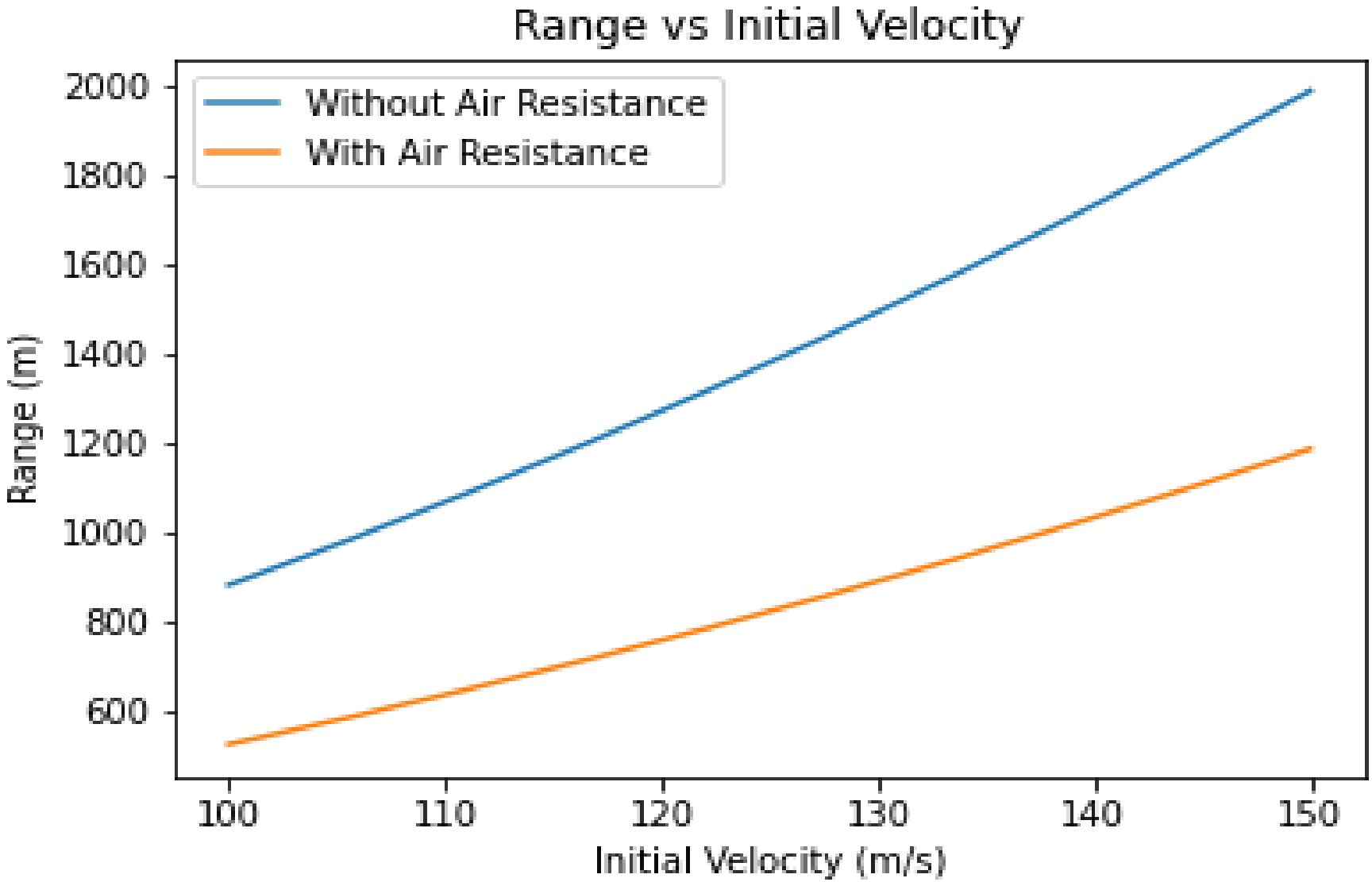
99877

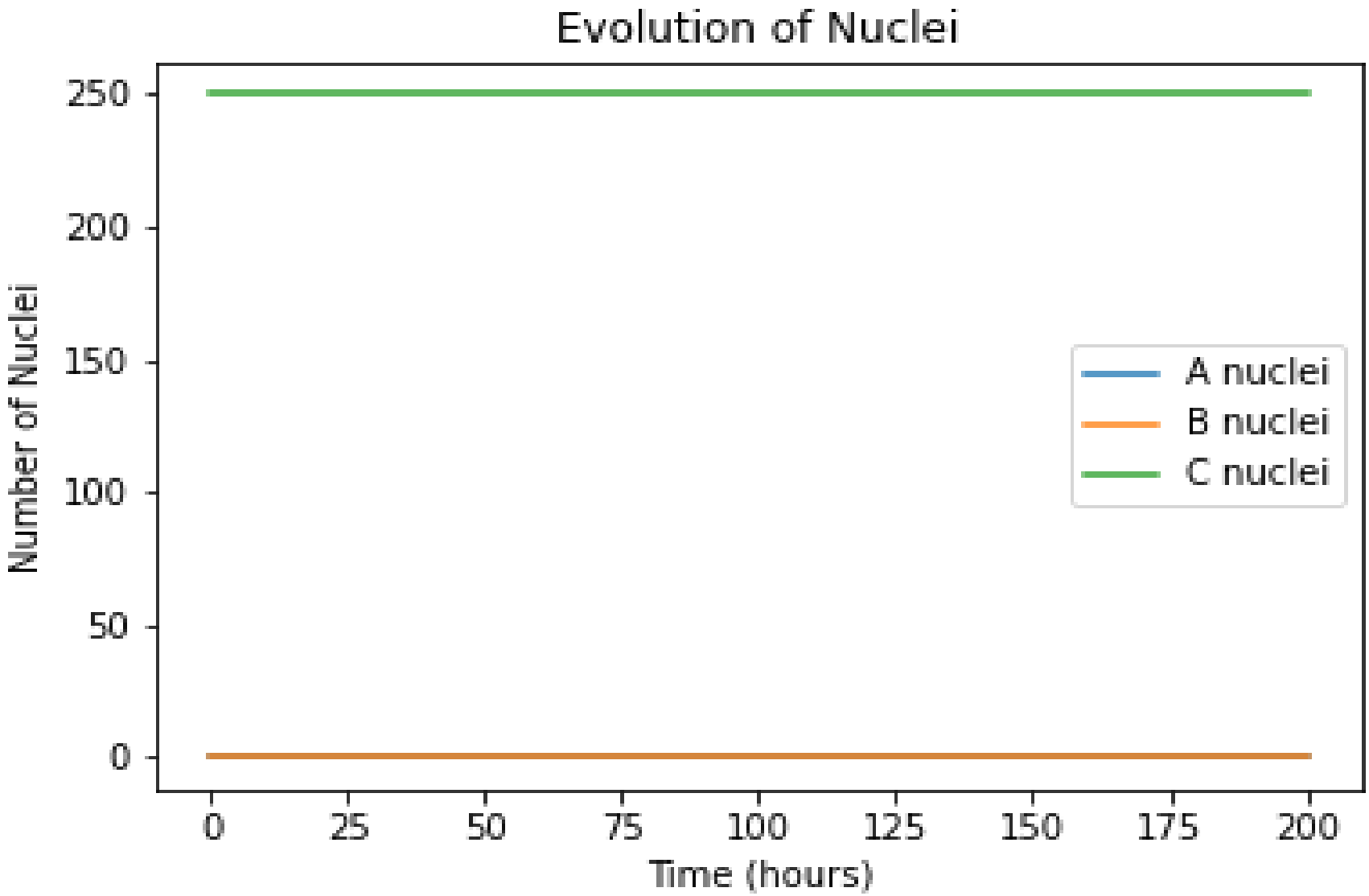

Difference between Analytical and Numerical Derivatives
dx = 1.0
dx = 0.1
dx = 0.01
Difference
x
1.5
1.0
0.5
0.0
−0.5
−1.0
−1.5
0
1
2
3
4
5
6

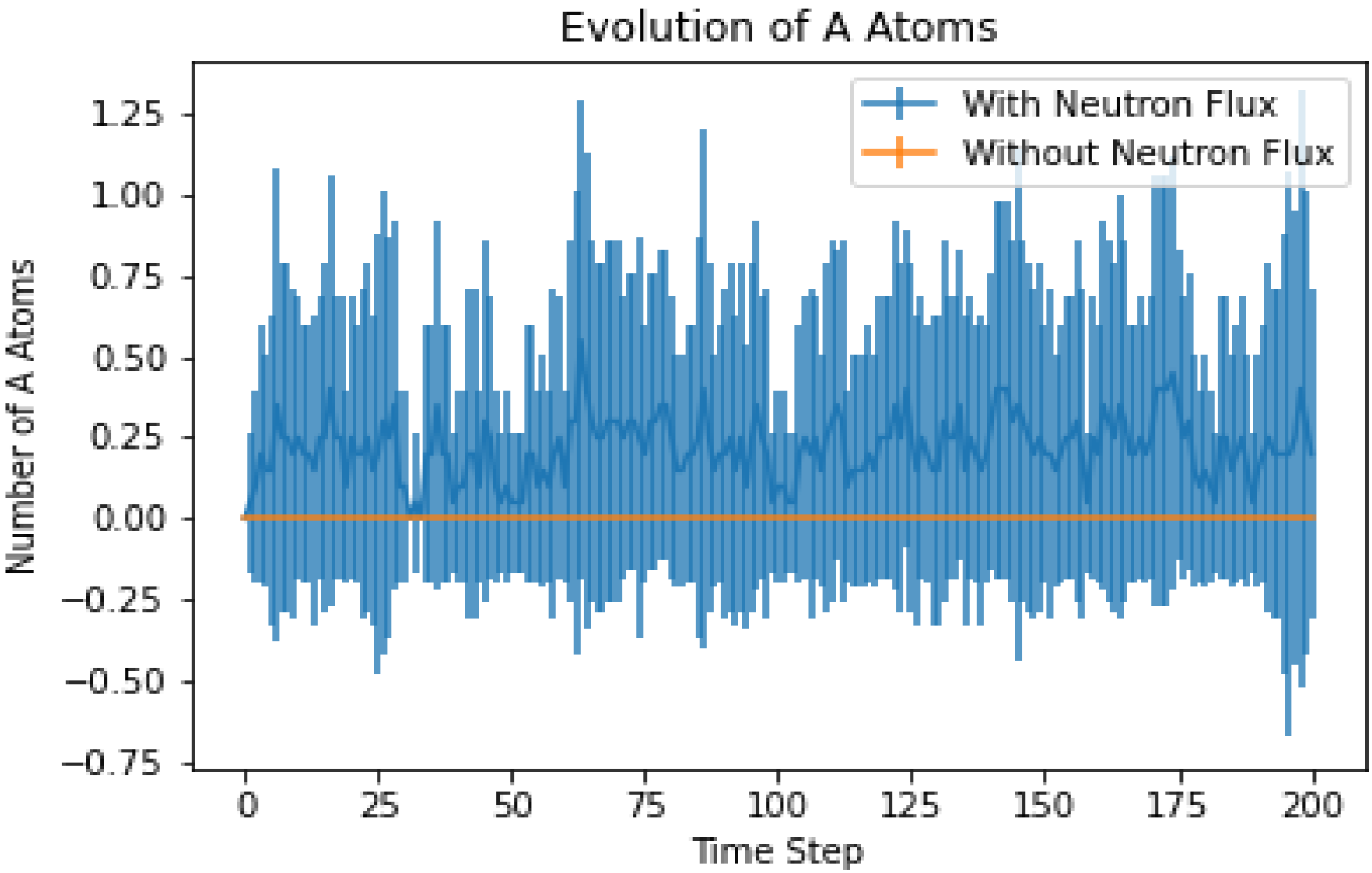

Fractional Error in Numerical Integration using Simpson's Rule
2.2 × 10^0
2 × 10^0
1.8 × 10^0
1.6 × 10^0
1.4 × 10^0
10^1
10^2
Number of Panels

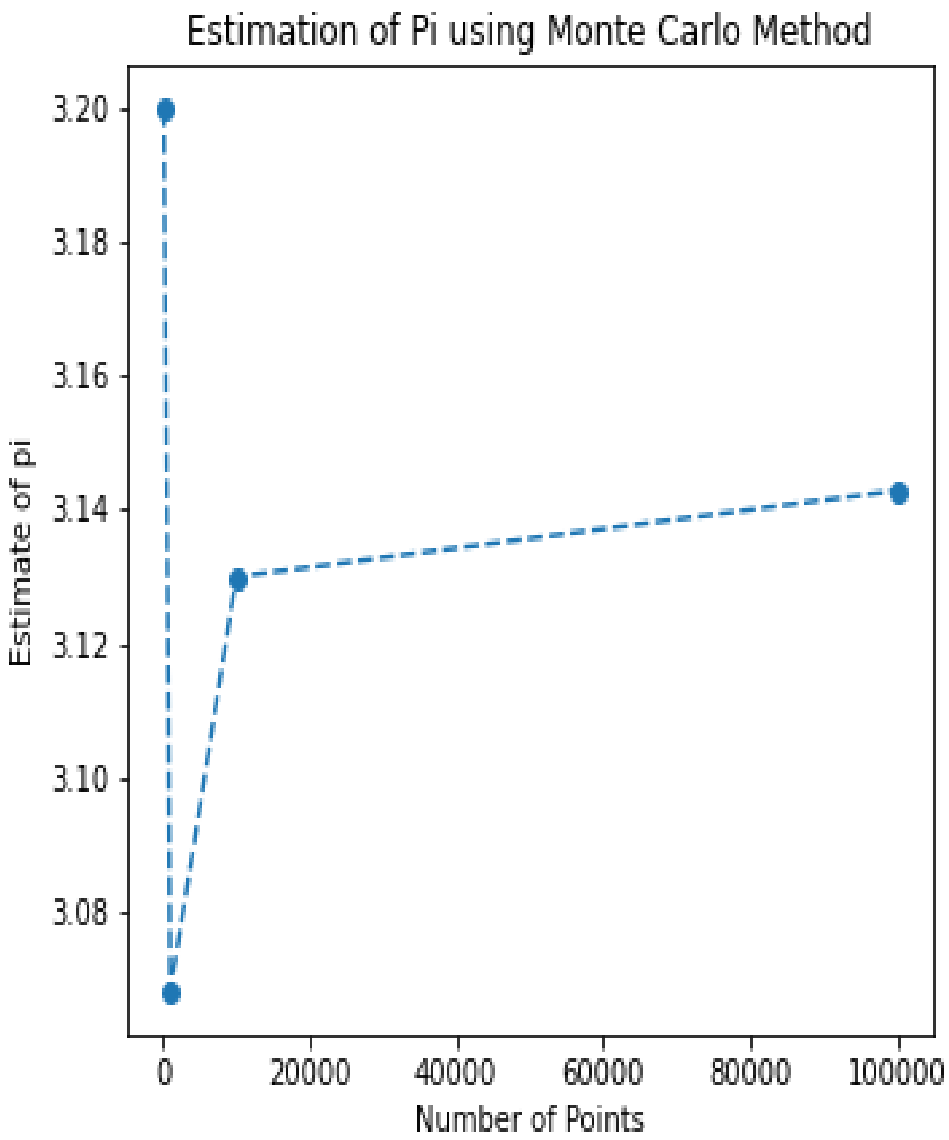

Error in Radioactive Decay
Euler
RK4
0.175
0.150
0.125
0.100
0.075
0.050
0.025
0.000
Error
0
2
4
6
8
10
Time

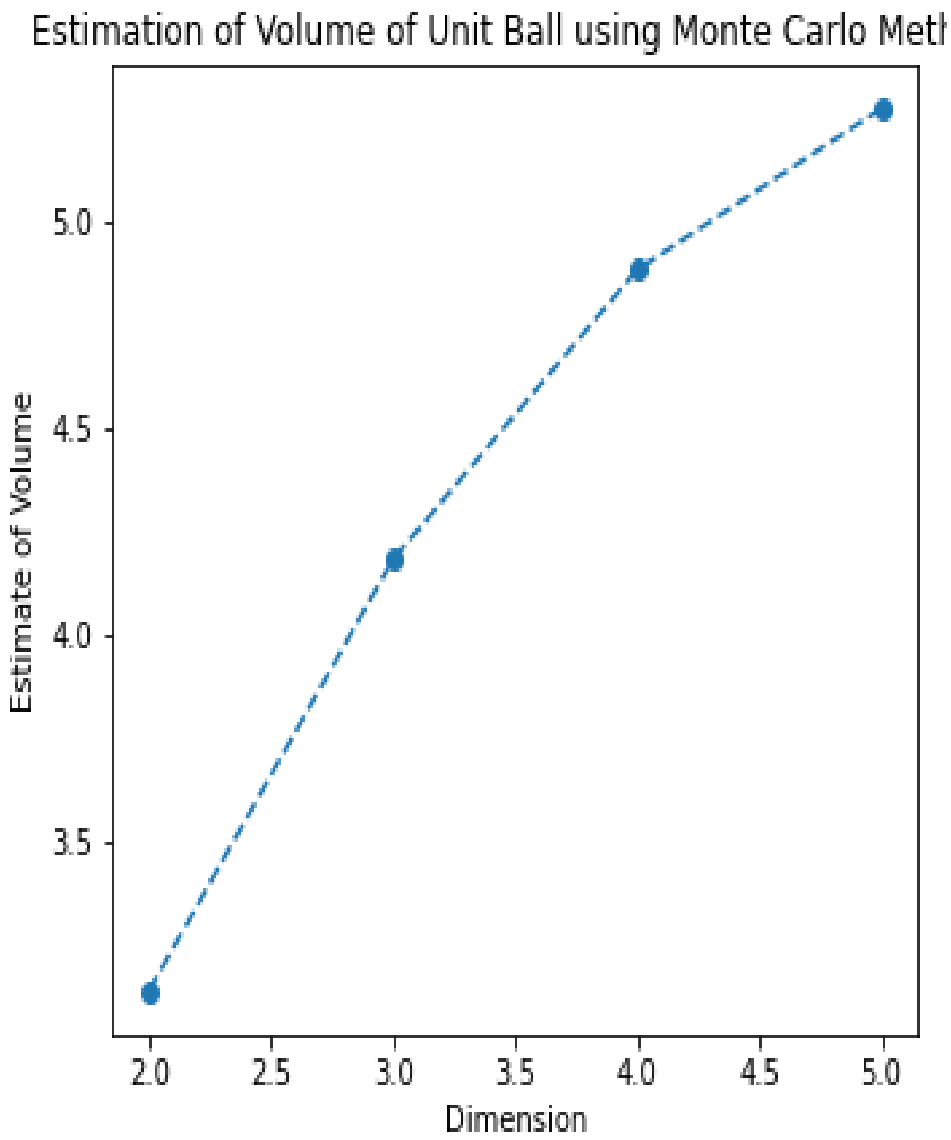

Projectile Range vs Launch Angle
Range (m)
1600
1400
1200
1000
800
600
400
200
0
0
20
40
60
80
Launch Angle (degrees)

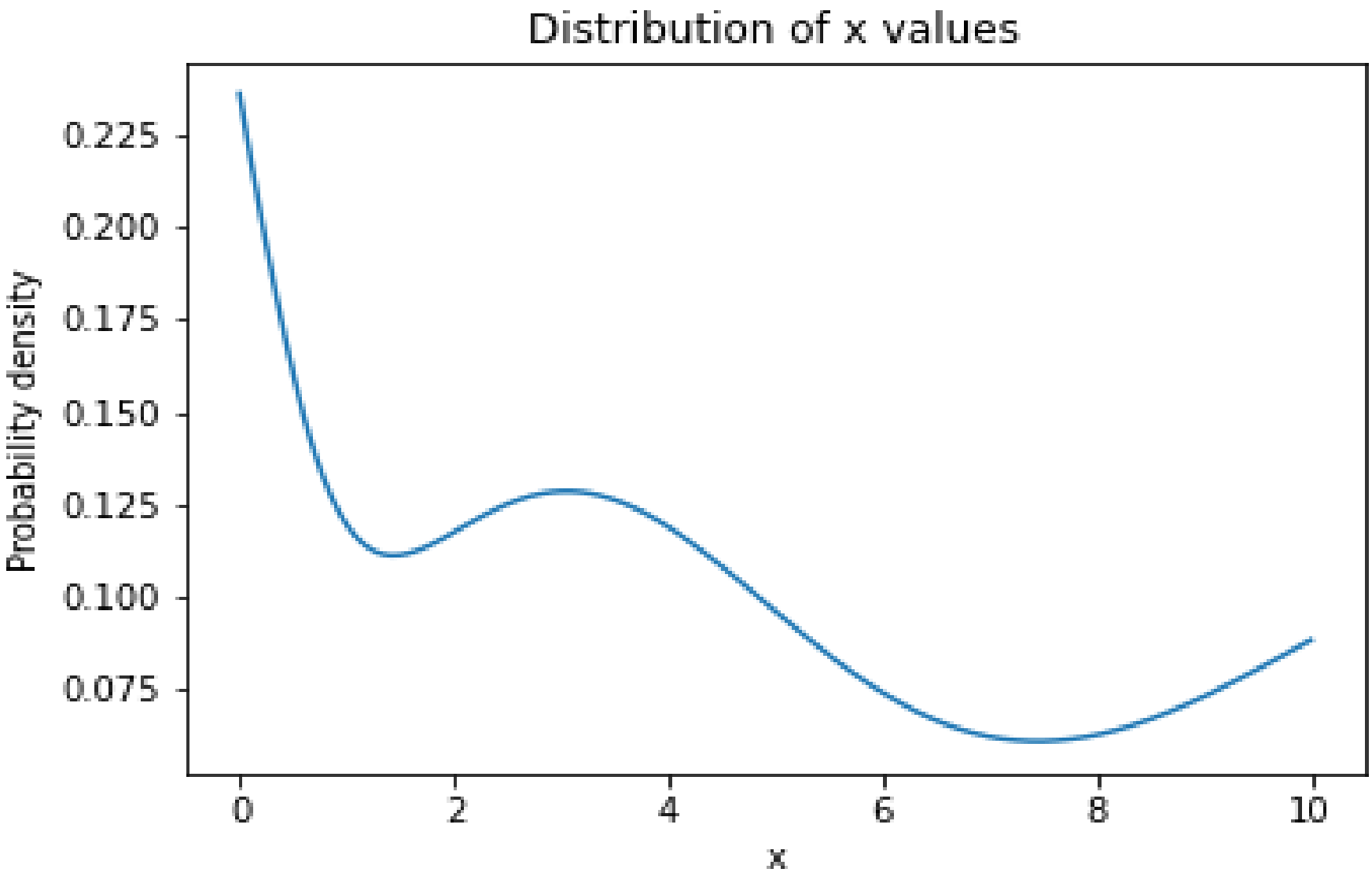

Range vs Initial Velocity
Without Air Resistance
With Air Resistance
Range (m)
2000
1800
1600
1400
1200
1000
800
600
100
110
120
130
140
150
Initial Velocity (m/s)

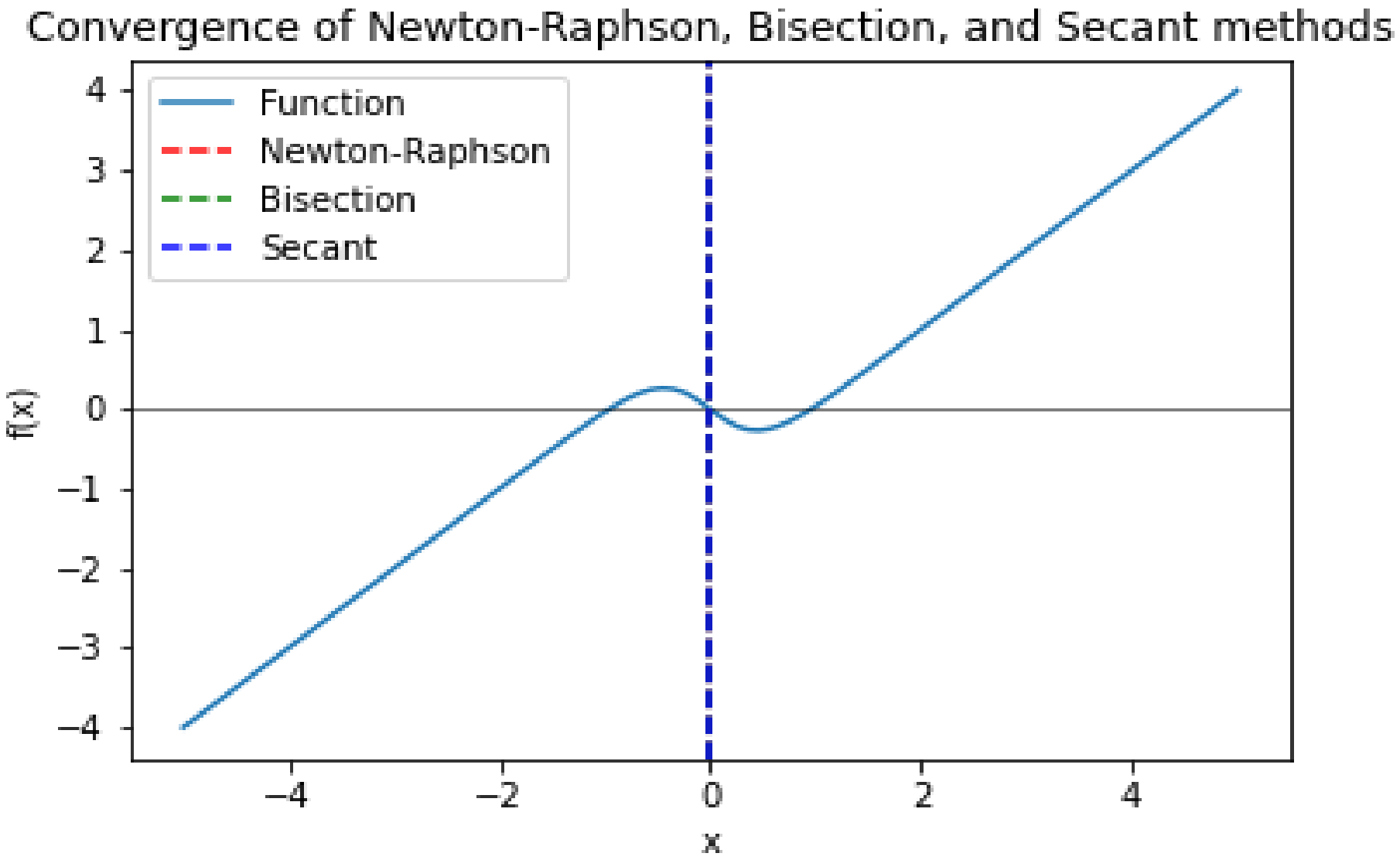

Evolution of Nuclei
Number of Nuclei
Time (hours)
A nuclei
B nuclei
C nuclei
250
200
150
100
50
0
0
25
50
75
100
125
150
175
200

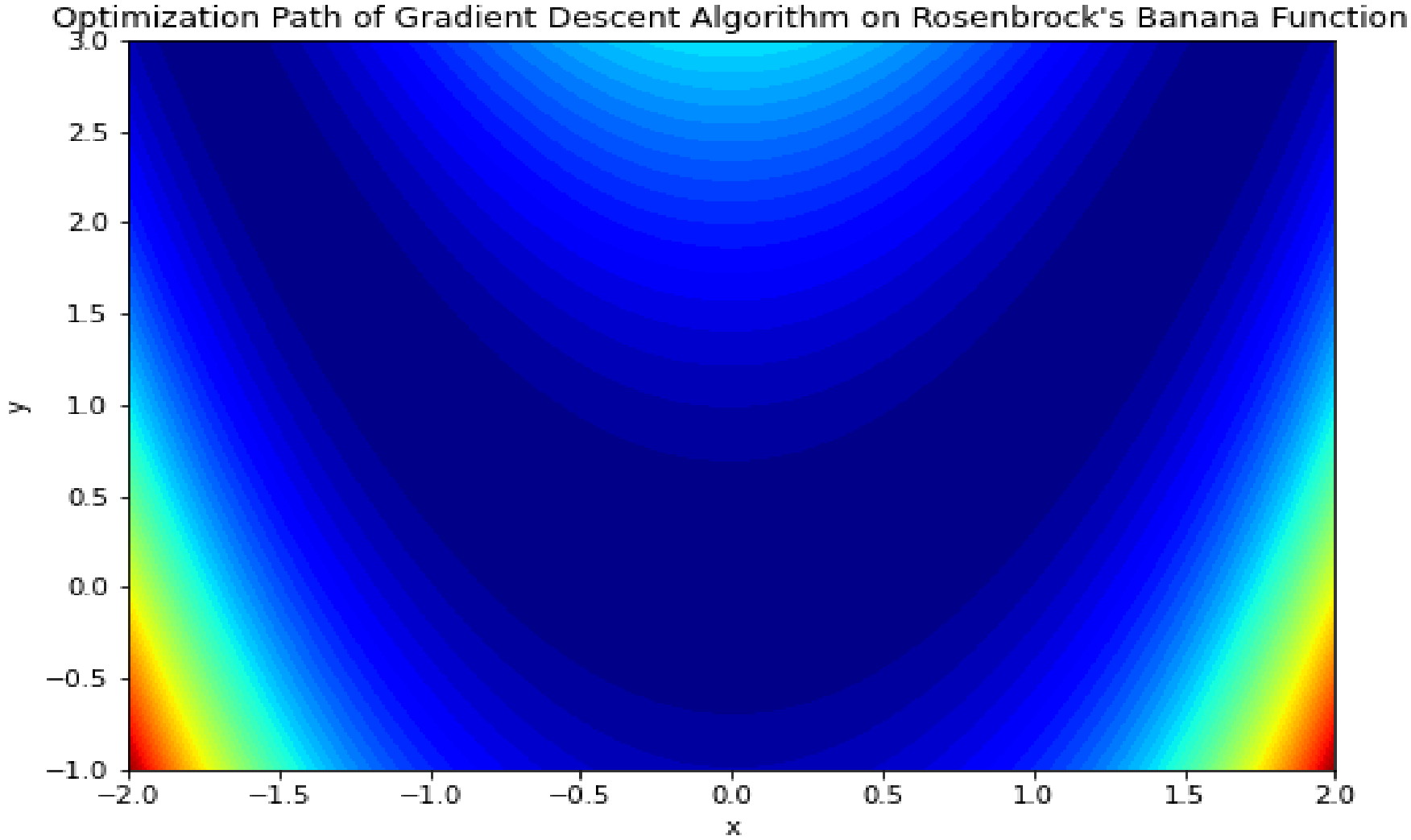

Evolution of A Atoms
With Neutron Flux
Without Neutron Flux
Number of A Atoms
Time Step
1.25
1.00
0.75
0.50
0.25
0.00
−0.25
−0.50
−0.75
0
25
50
75
100
125
150
175
200

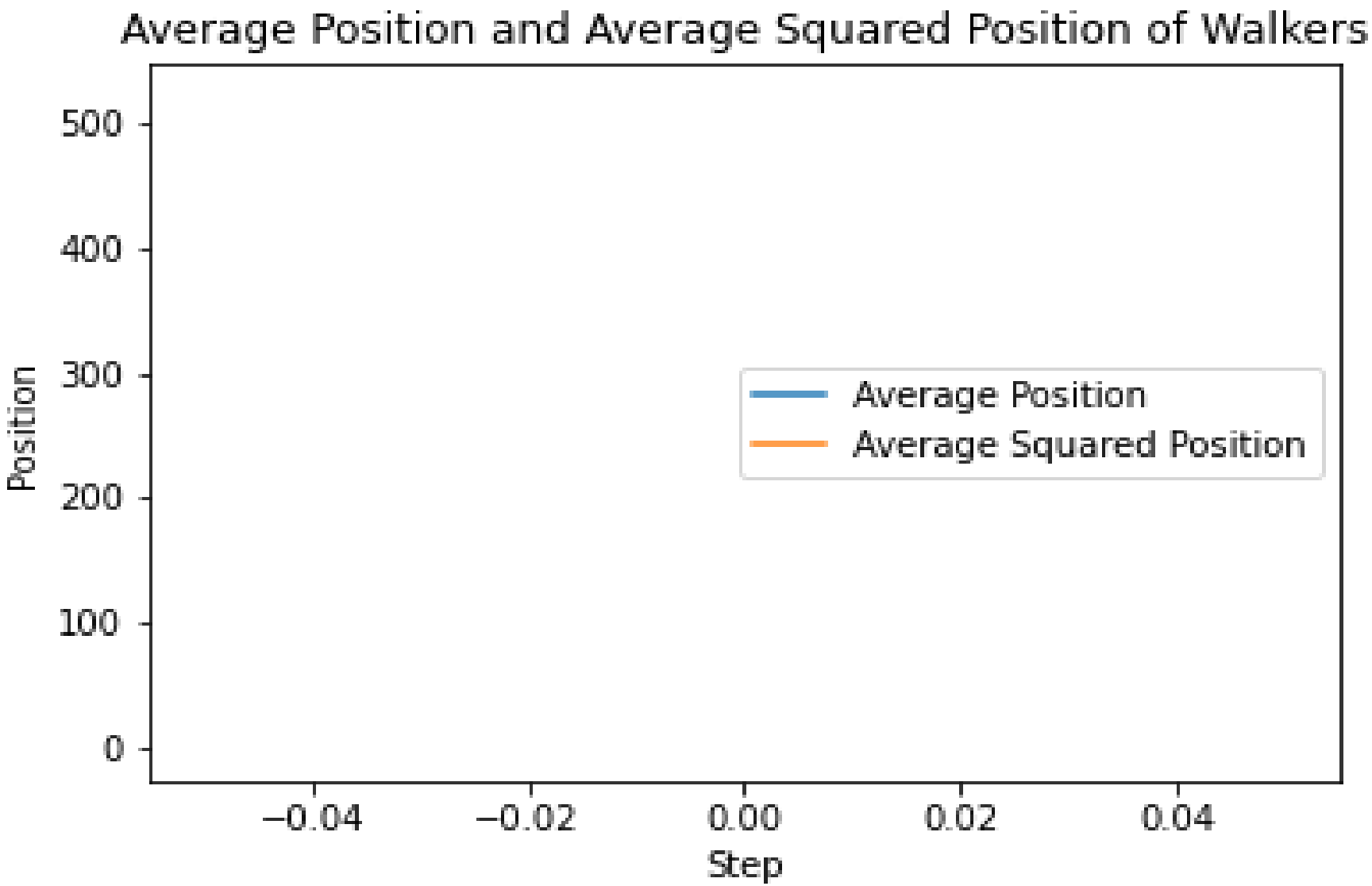

Estimation of Pi using Monte Carlo Method
Estimate of pi
3.20
3.18
3.16
3.14
3.12
3.10
3.08
0
20000
40000
60000
80000
100000
Number of Points

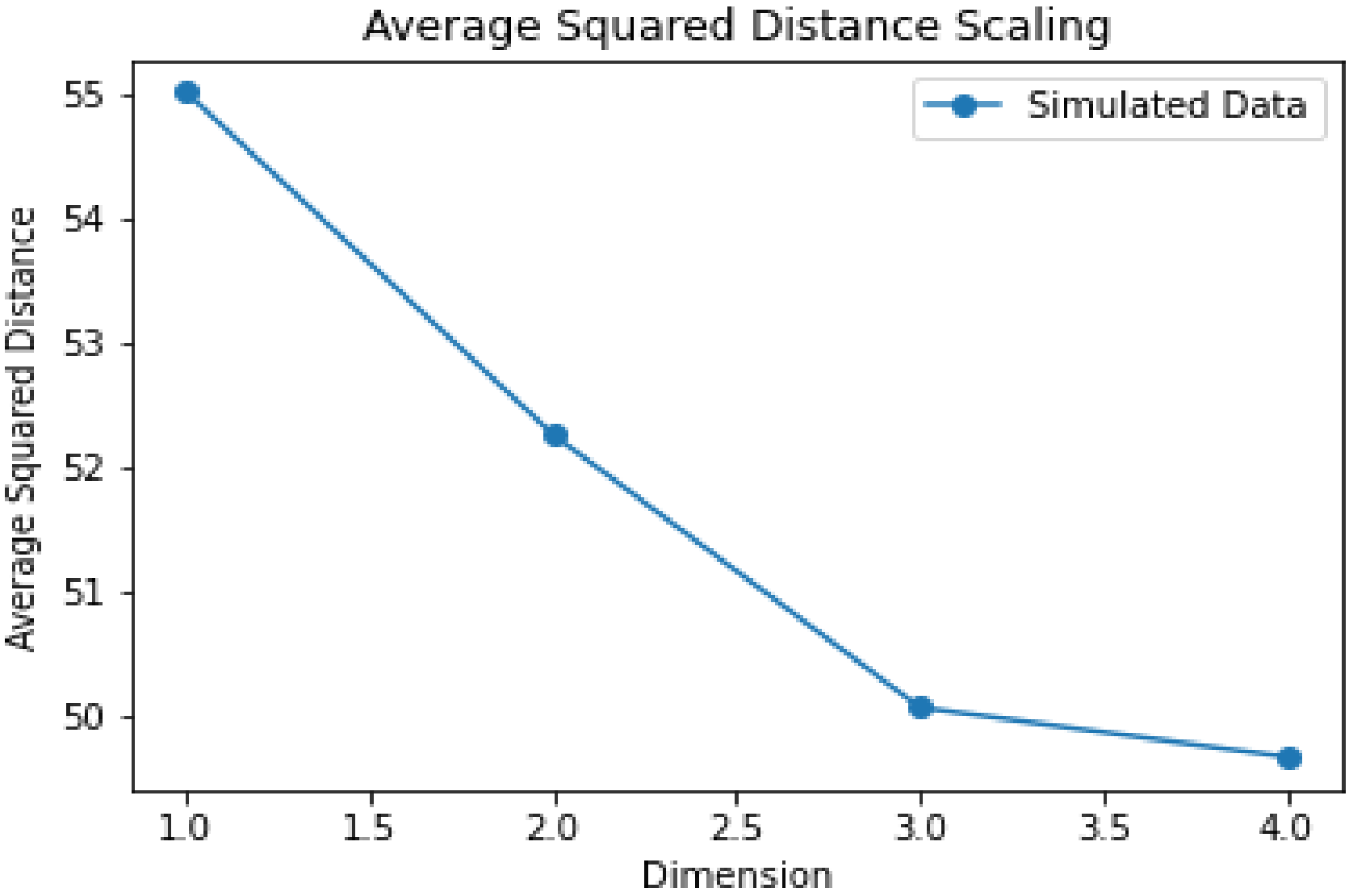

Estimation of Volume of Unit Ball using Monte Carlo Metl
Estimate of Volume
5.0
4.5
4.0
3.5
2.0
2.5
3.0
3.5
4.0
4.5
5.0
Dimension

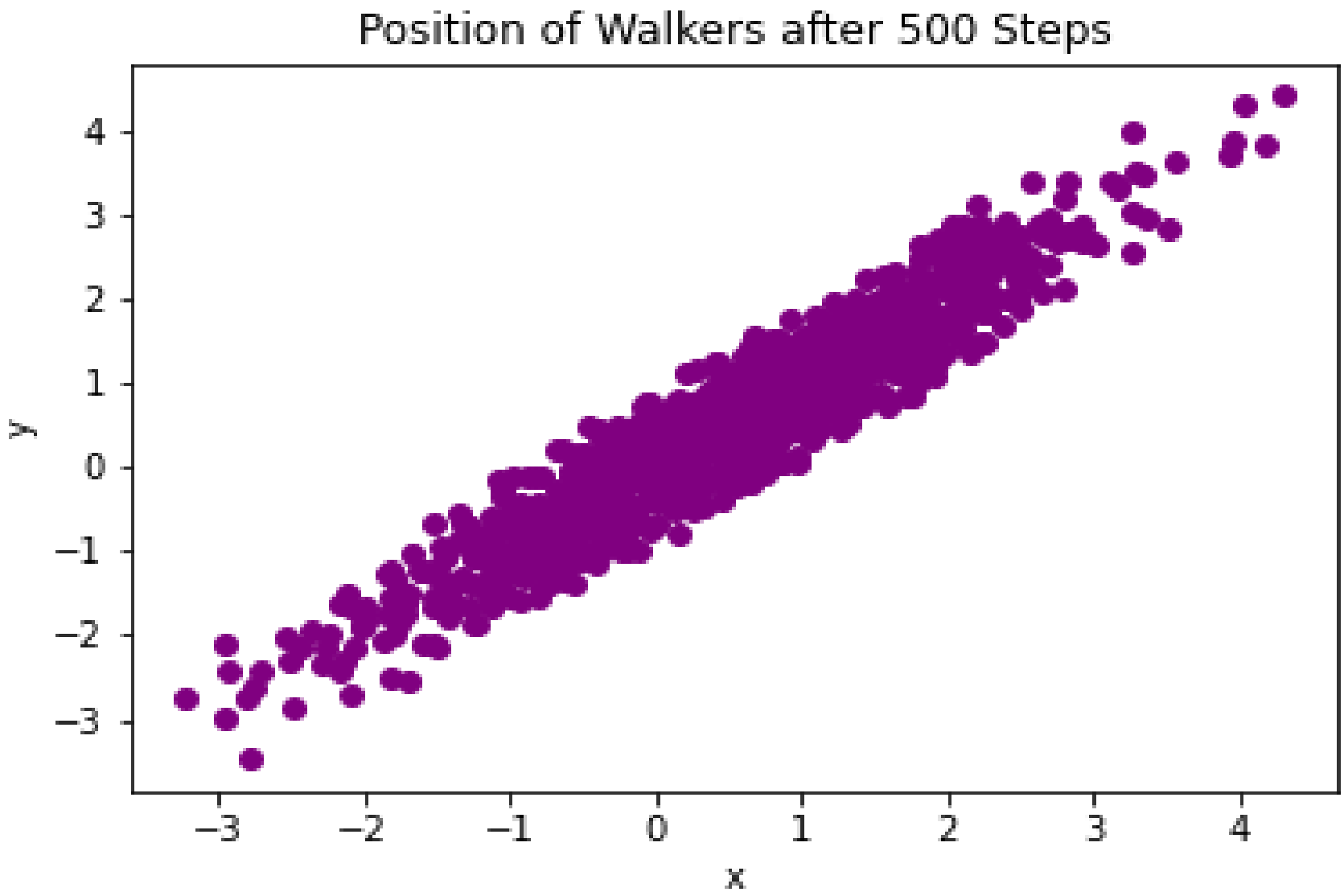

Distribution of x values
Probability density
0.225
0.200
0.175
0.150
0.125
0.100
0.075
0
2
4
6
8
10
x


Convergence of Newton-Raphson, Bisection, and Secant methods
Function
Newton-Raphson
Bisection
Secant
f(x)
x
4
3
2
1
0
−1
−2
−3
−4
−4
−2
0
2
4


Optimization Path of Gradient Descent Algorithm on Rosenbrock's Banana Function
3.0
2.5
2.0
1.5
1.0
0.5
0.0
−0.5
−1.0
y
−2.0
−1.5
−1.0
−0.5
0.0
0.5
1.0
1.5
2.0
x


Average Position and Average Squared Position of Walkers
500
400
300
200
100
0
Position
−0.04
−0.02
0.00
0.02
0.04
Step
Average Position
Average Squared Position


Average Squared Distance Scaling
Simulated Data
Average Squared Distance
55
54
53
52
51
50
1.0
1.5
2.0
2.5
3.0
3.5
4.0
Dimension


Position of Walkers after 500 Steps
y
x
4
3
2
1
0
−1
−2
−3
−3
−2
−1
0
1
2
3
4

AI?