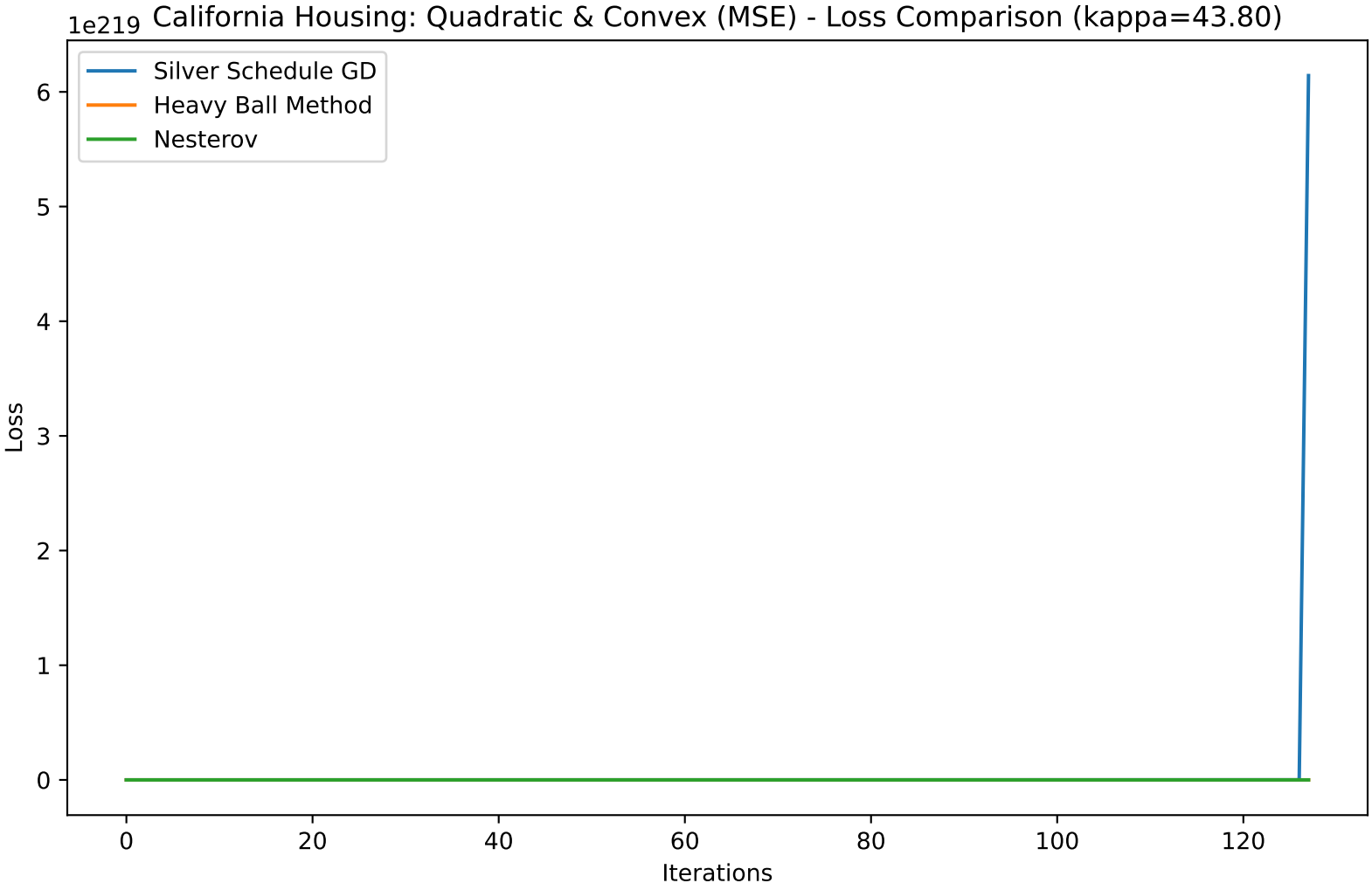
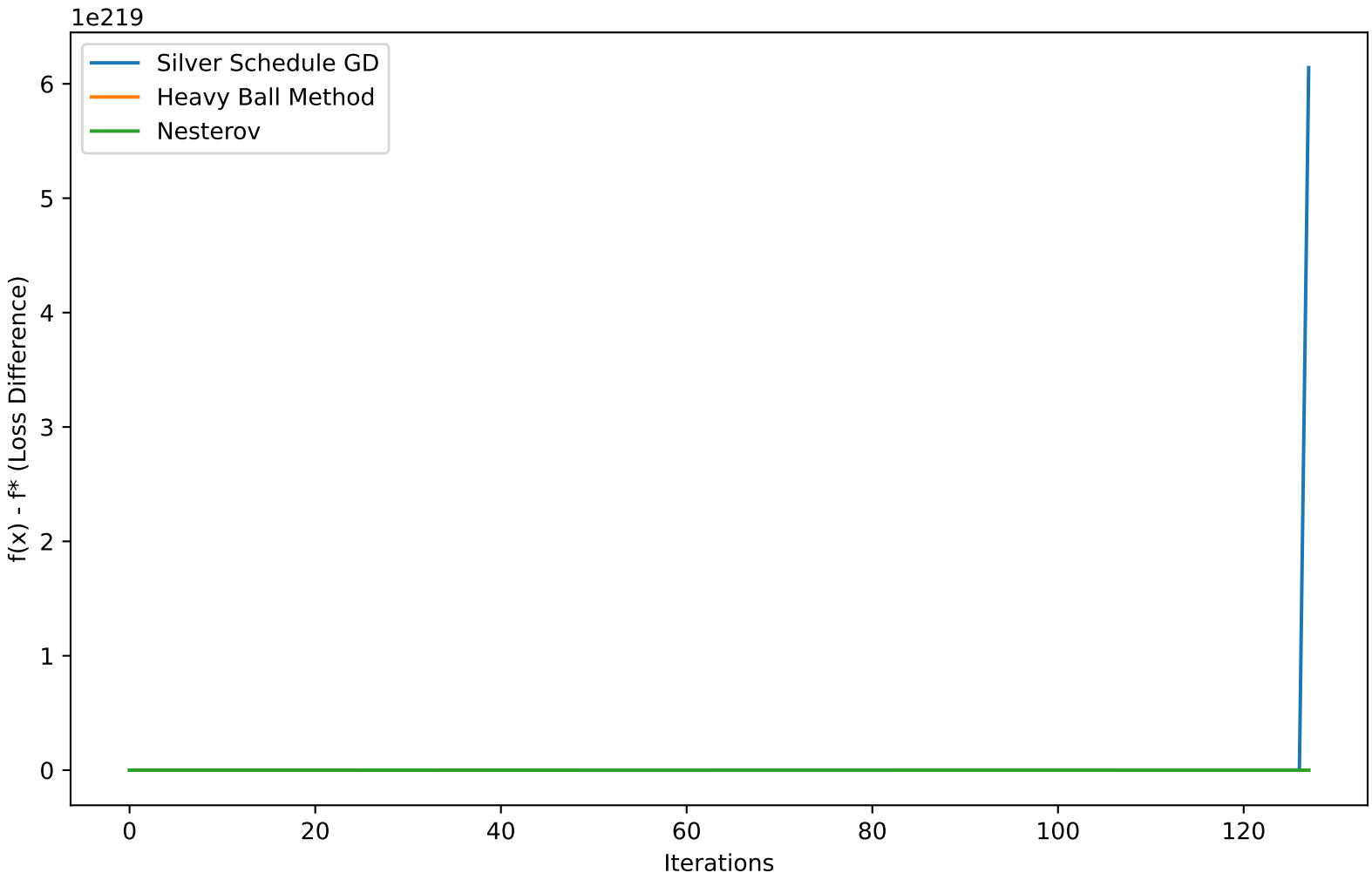
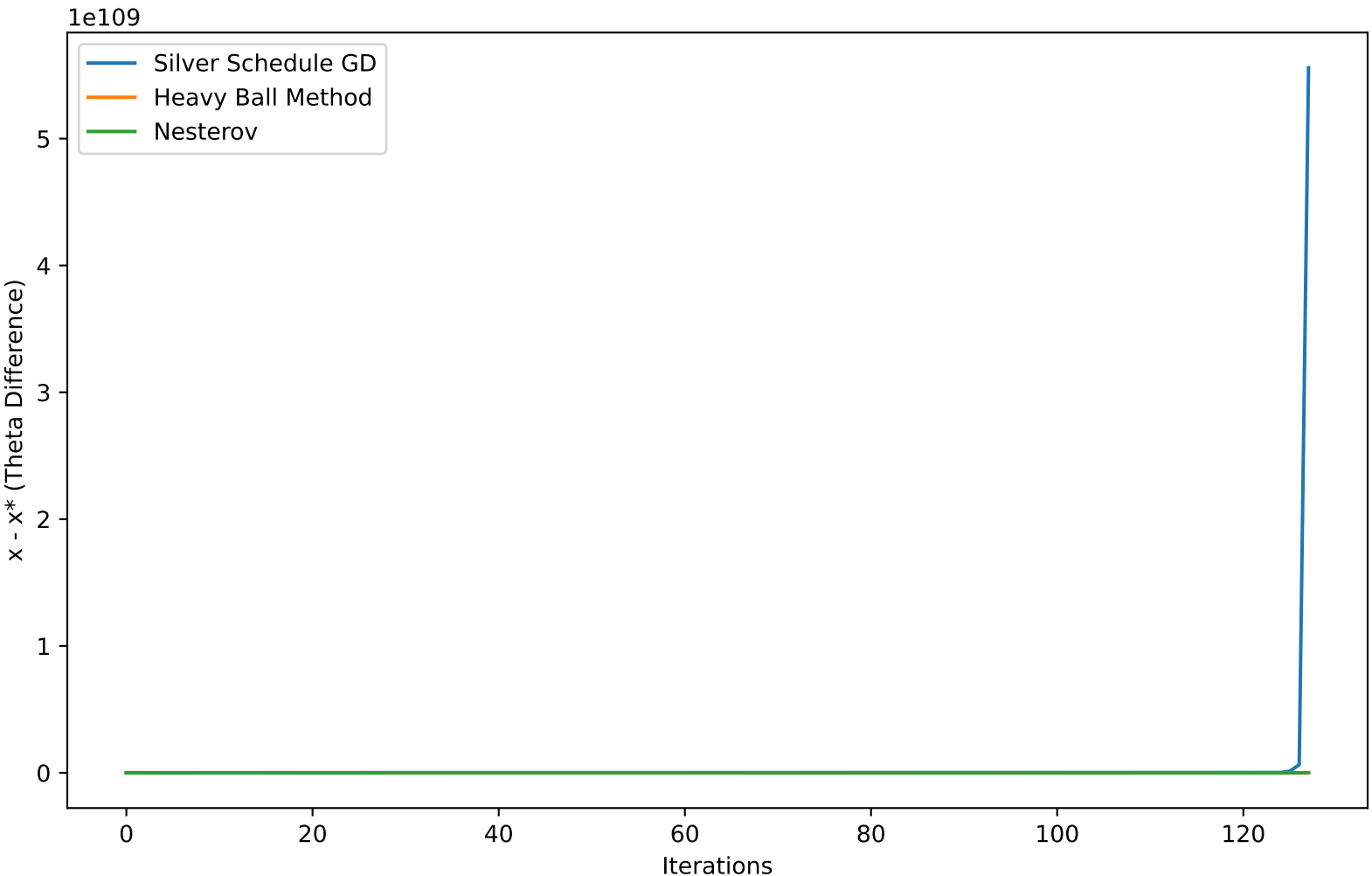
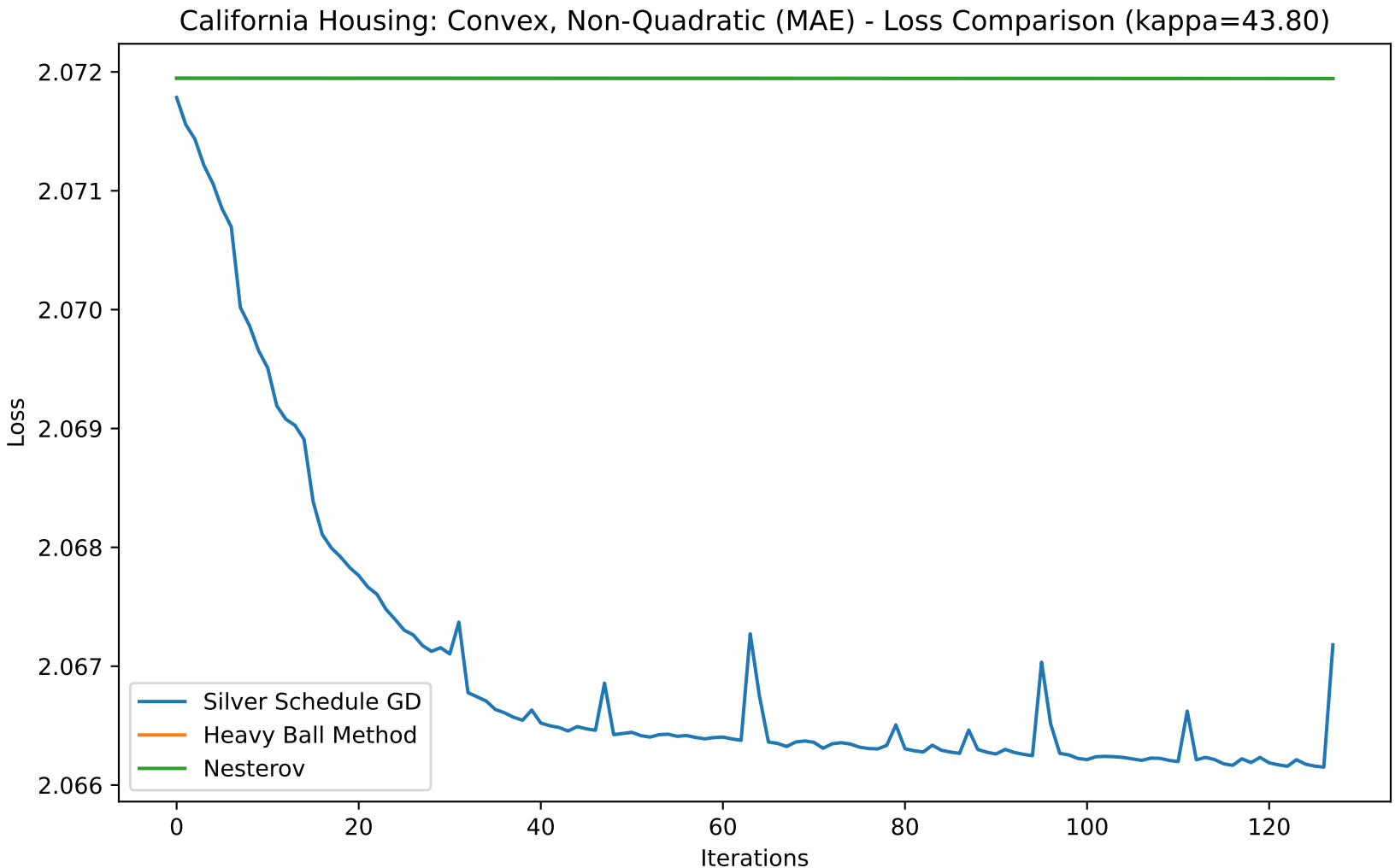
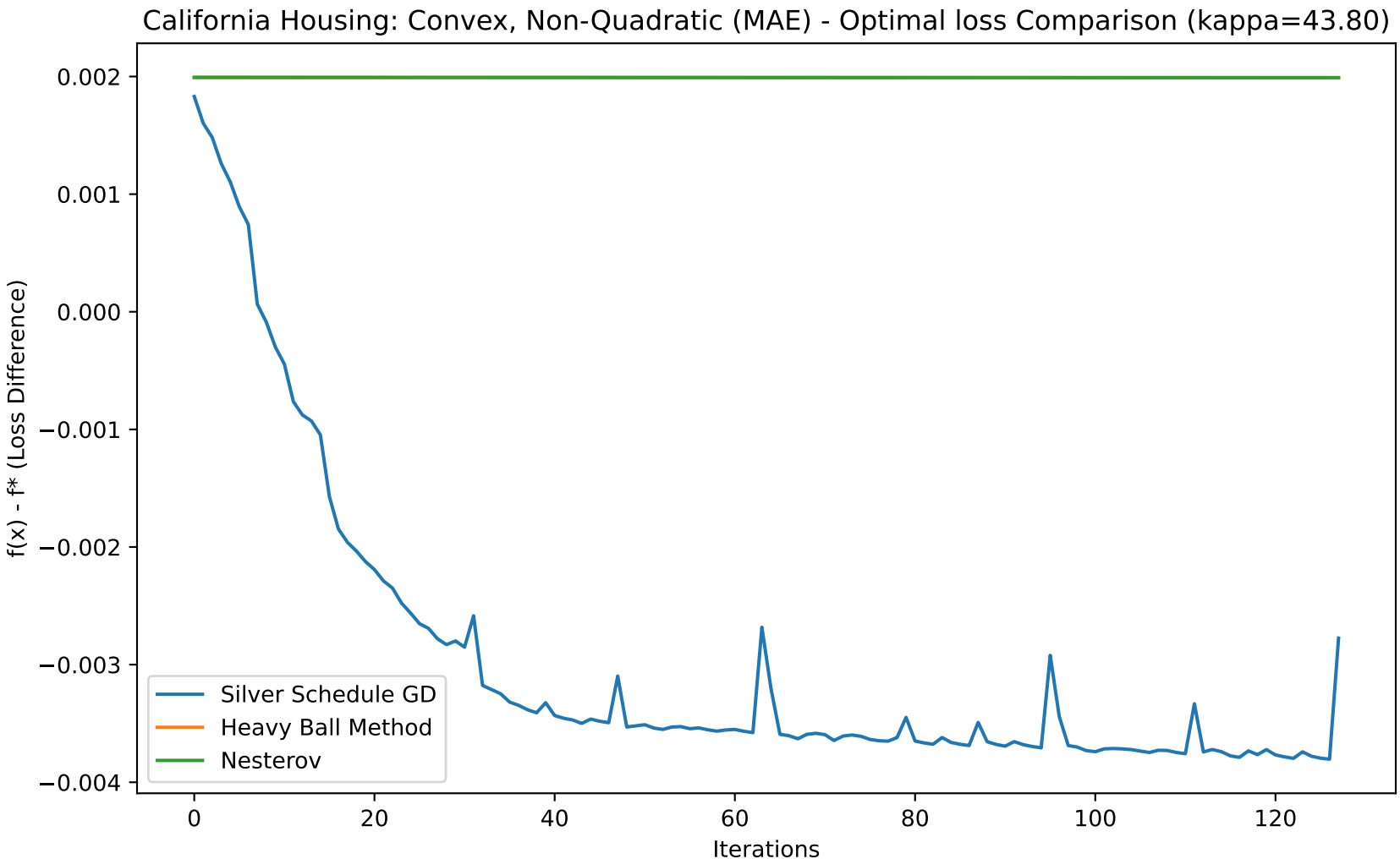
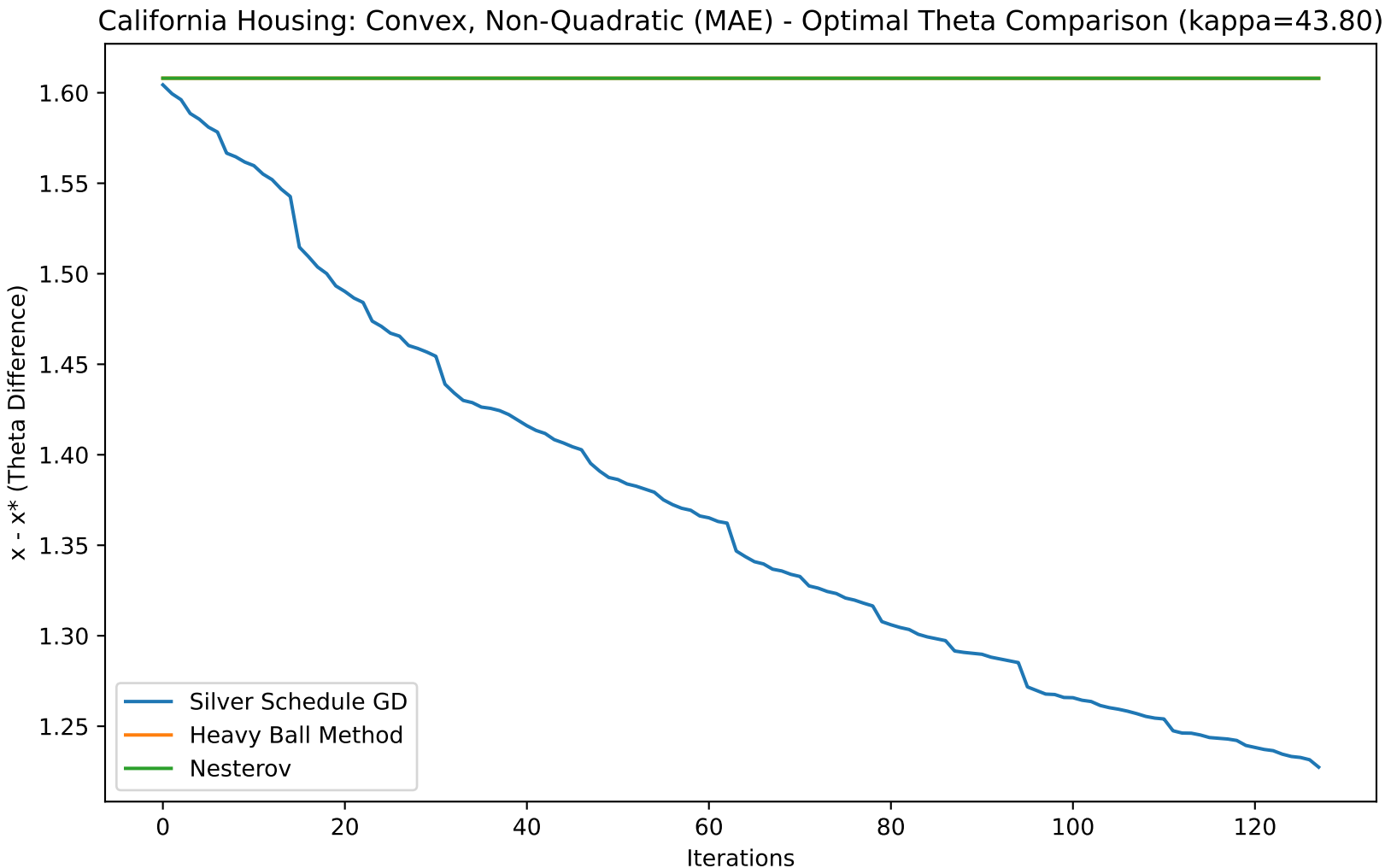

California Housing: Quadratic & Convex (MSE) - Loss Comparison (kappa=43.80)
1e219
Silver Schedule GD
Heavy Ball Method
Nesterov
Loss
Iterations
0
1
2
3
4
5
6
0
20
40
60
80
100
120

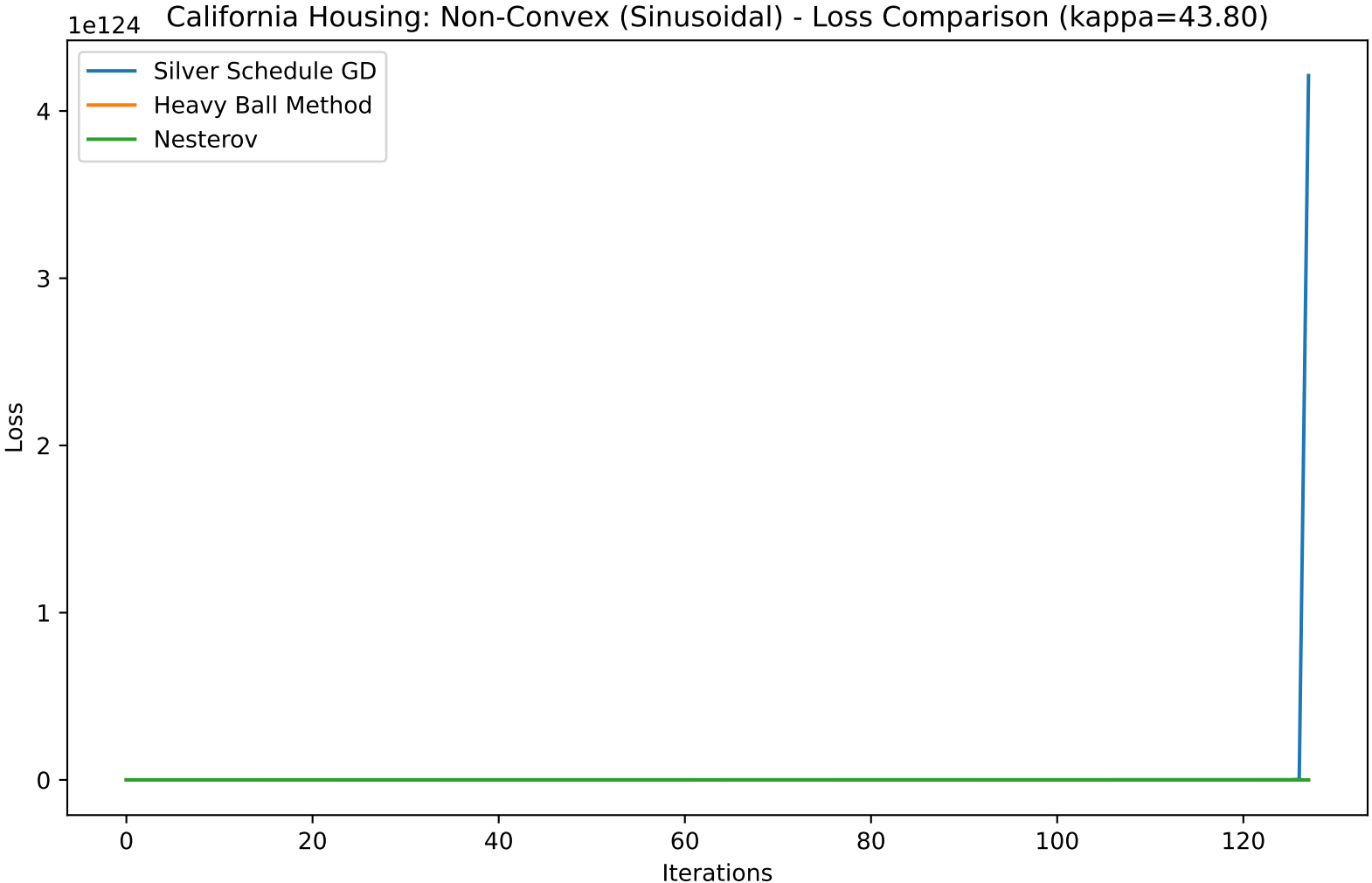

California Housing: Quadratic & Convex (MSE) - Optimal loss Comparison (kappa=43.80)
1e219
Silver Schedule GD
Heavy Ball Method
Nesterov
f(x) - f* (Loss Difference)
Iterations
0
1
2
3
4
5
6
0
20
40
60
80
100
120

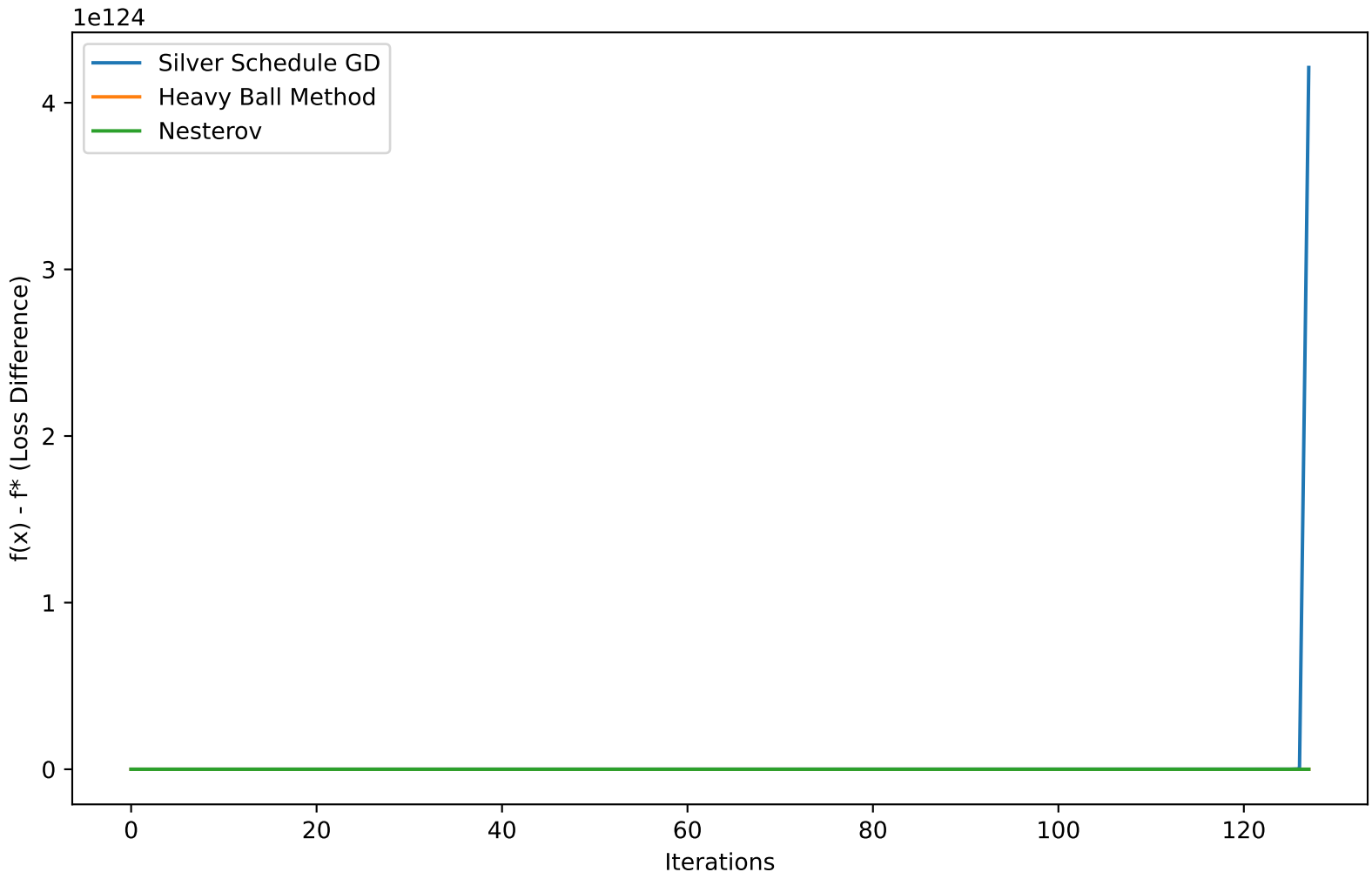

California Housing: Quadratic & Convex (MSE) - Optimal Theta Comparison (kappa=43.80)
1e109
Silver Schedule GD
Heavy Ball Method
Nesterov
x - x* (Theta Difference)
Iterations
0
1
2
3
4
5
0
20
40
60
80
100
120

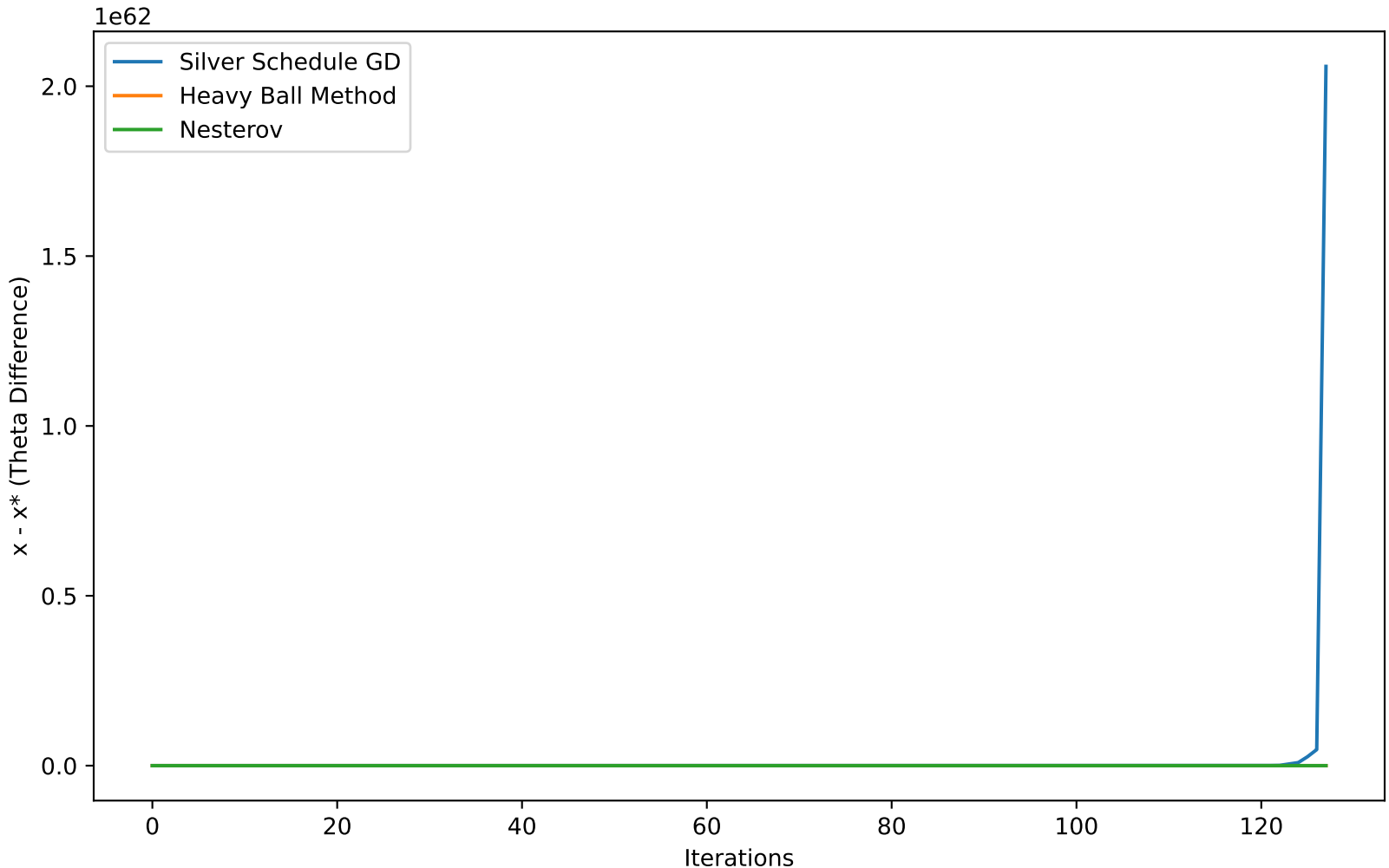

California Housing: Convex, Non-Quadratic (MAE) - Loss Comparison (kappa=43.80)
Loss
Iterations
2.072
2.071
2.070
2.069
2.068
2.067
2.066
0
20
40
60
80
100
120
Silver Schedule GD
Heavy Ball Method
Nesterov

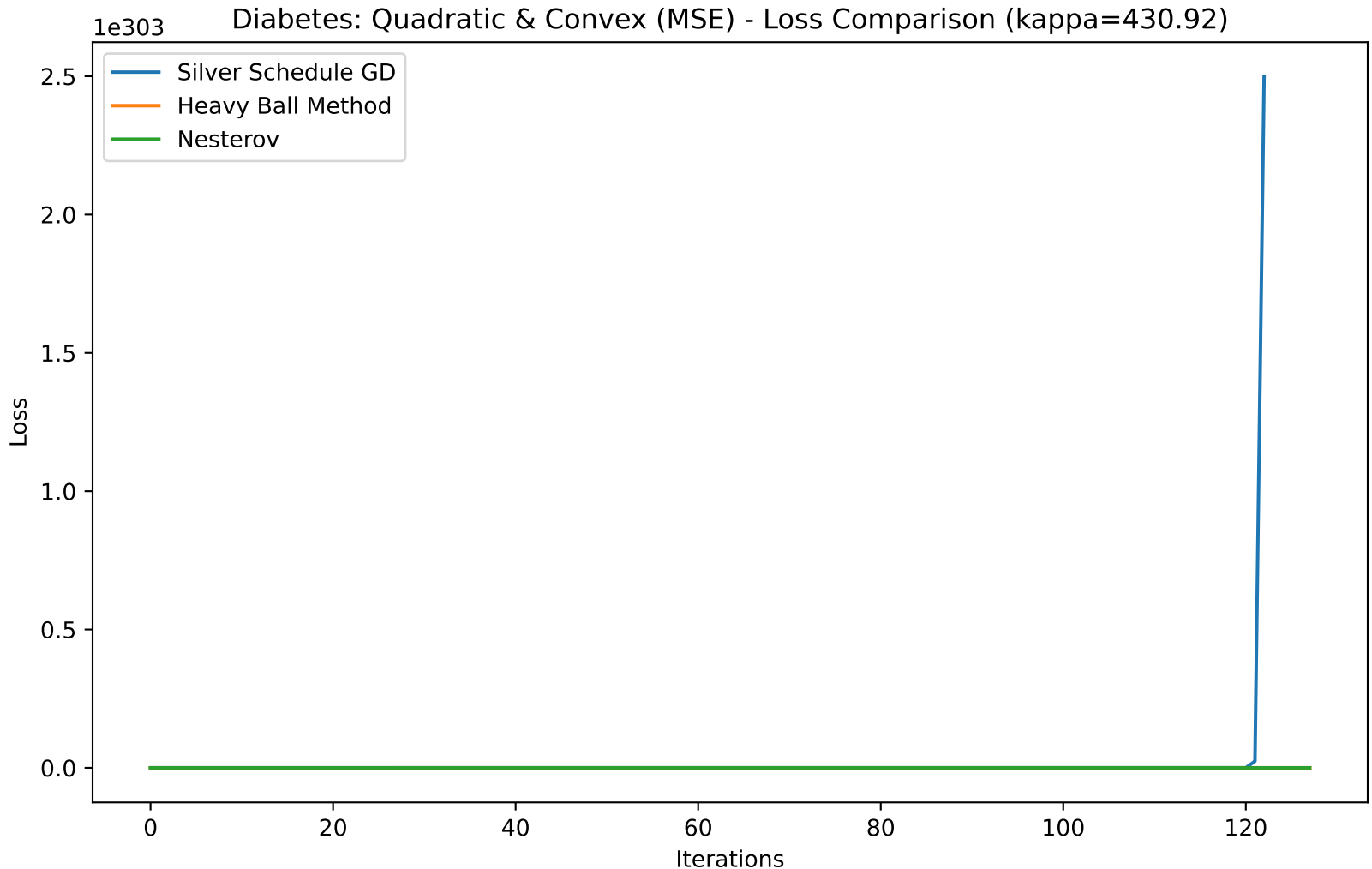

California Housing: Convex, Non-Quadratic (MAE) - Optimal loss Comparison (kappa=43.80)
0.002
0.001
0.000
−0.001
−0.002
−0.003
−0.004
f(x) - f* (Loss Difference)
0
20
40
60
80
100
120
Iterations
Silver Schedule GD
Heavy Ball Method
Nesterov

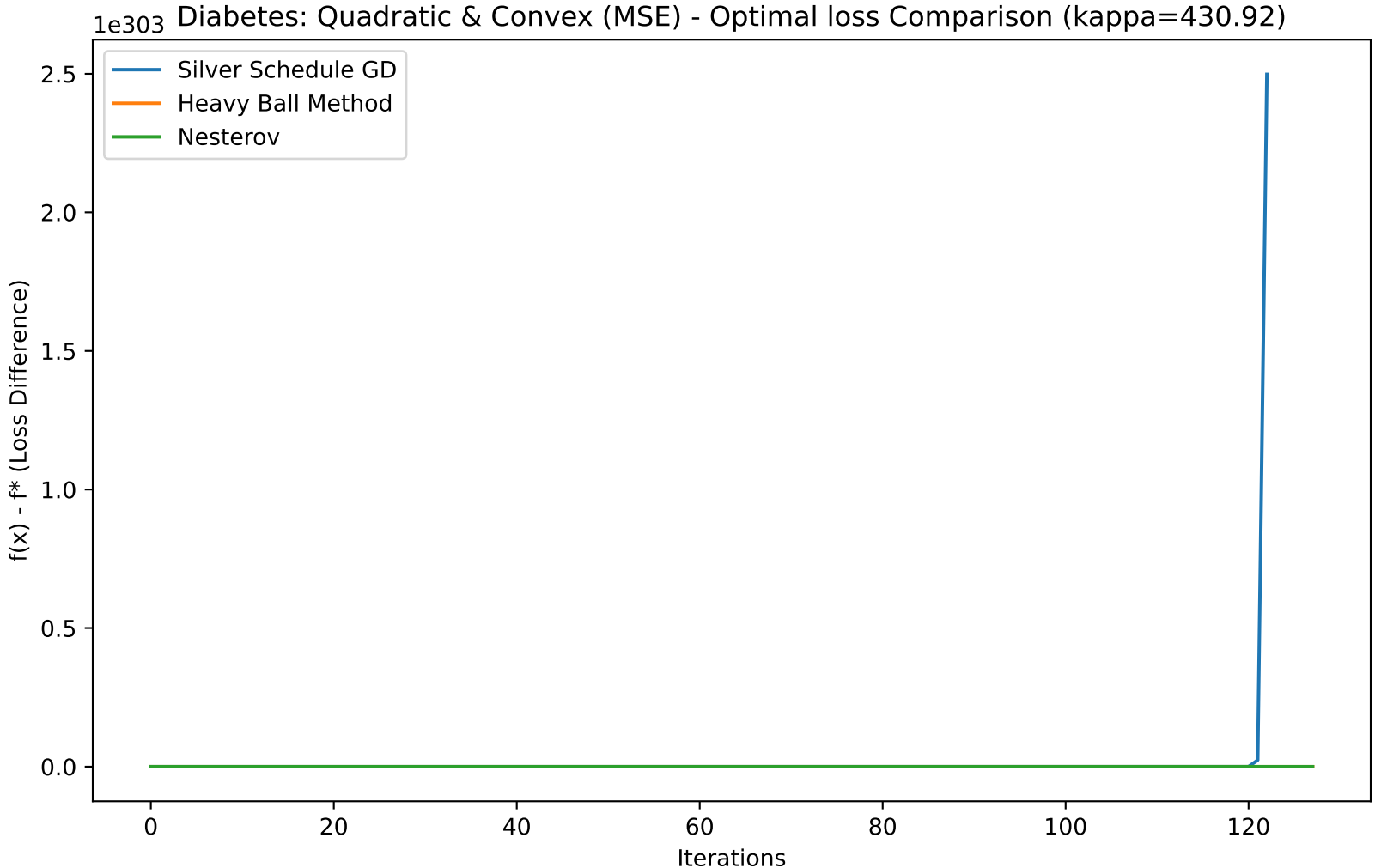

California Housing: Convex, Non-Quadratic (MAE) - Optimal Theta Comparison (kappa=43.80)
x - x* (Theta Difference)
Iterations
1.60
1.55
1.50
1.45
1.40
1.35
1.30
1.25
0
20
40
60
80
100
120
Silver Schedule GD
Heavy Ball Method
Nesterov

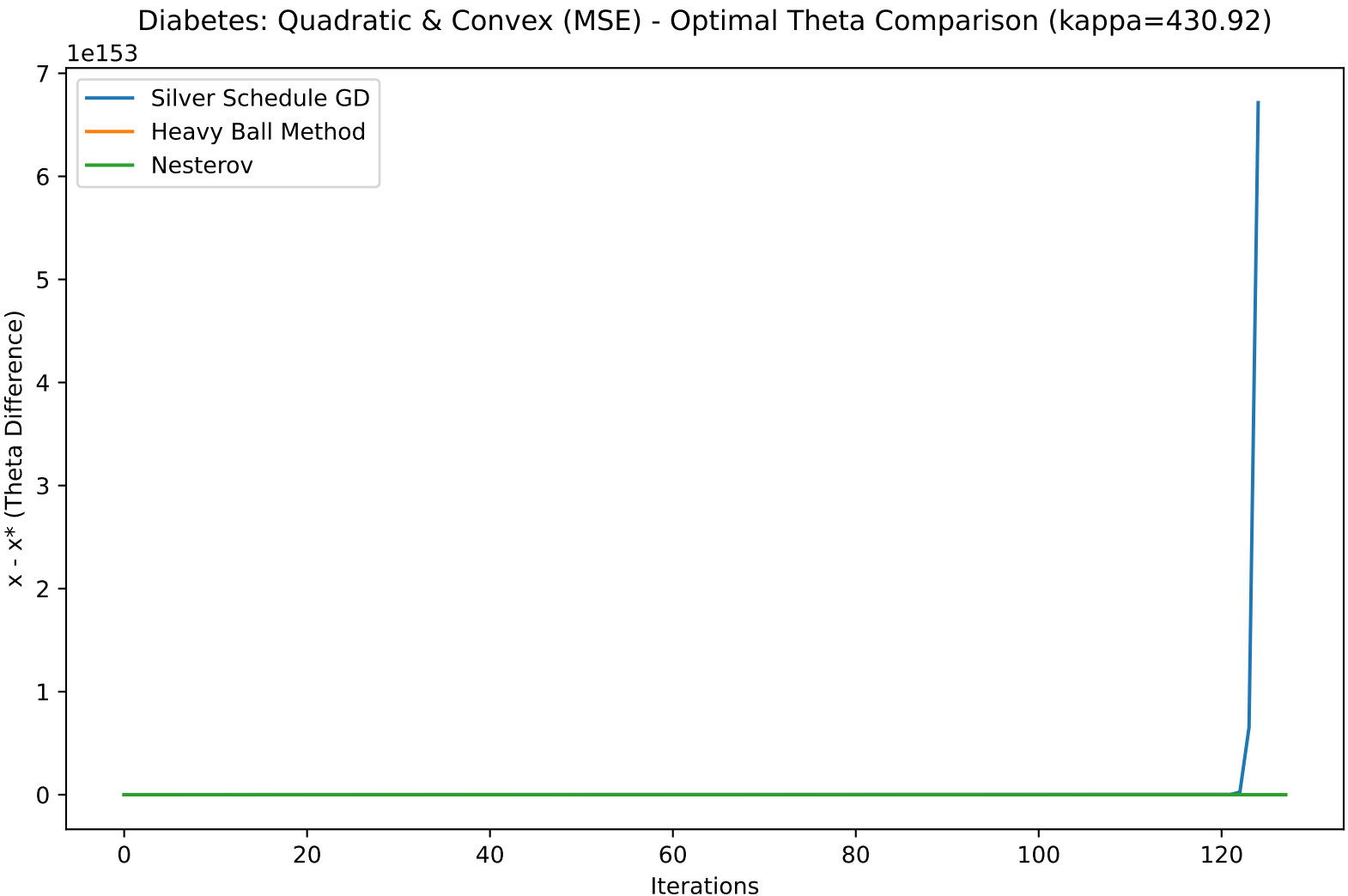

California Housing: Non-Convex (Sinusoidal) - Loss Comparison (kappa=43.80)
1e124
Silver Schedule GD
Heavy Ball Method
Nesterov
Loss
Iterations
0
1
2
3
4
0
20
40
60
80
100
120

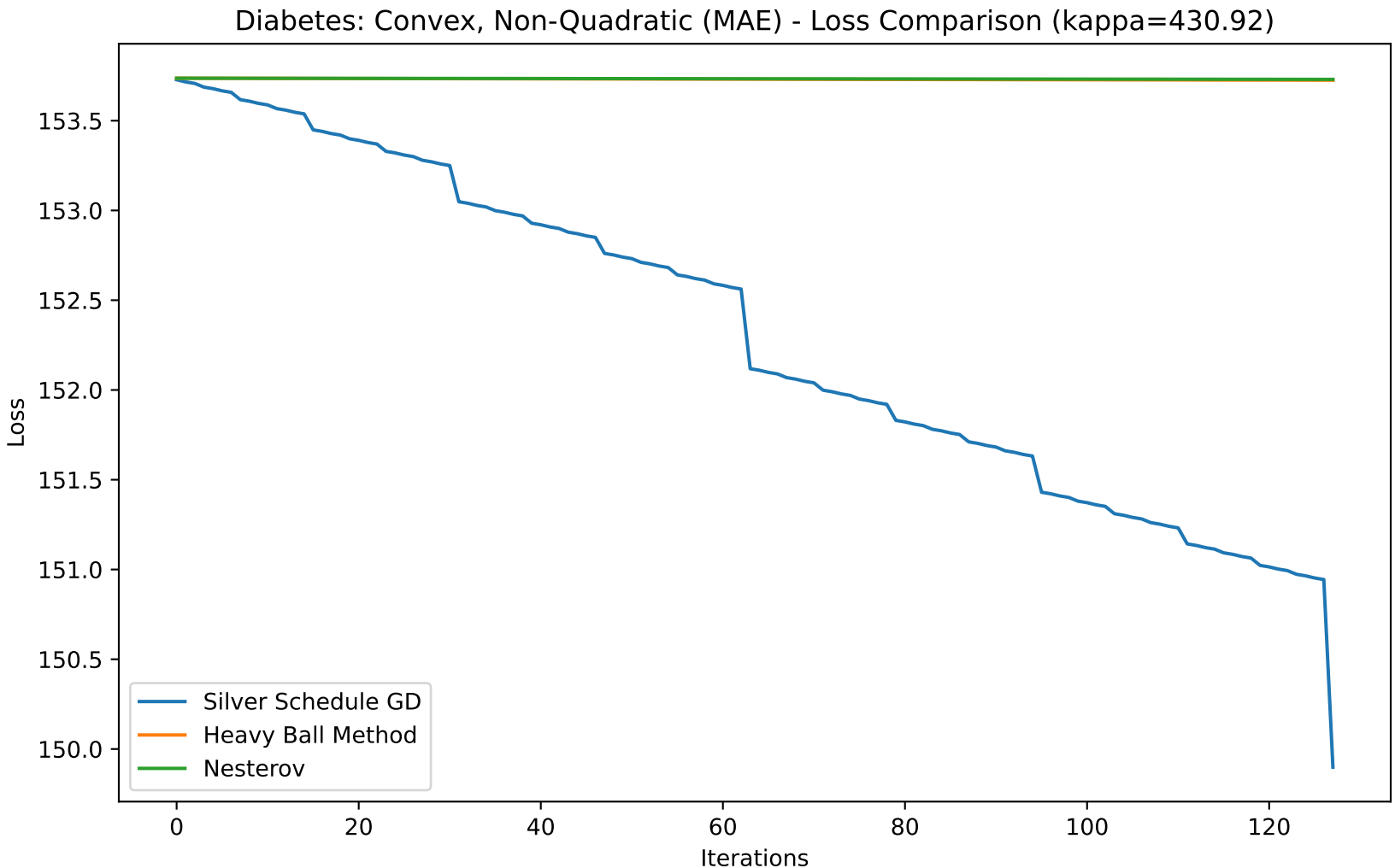

California Housing: Non-Convex (Sinusoidal) - Optimal loss Comparison (kappa=43.80)
1e124
Silver Schedule GD
Heavy Ball Method
Nesterov
f(x) - f* (Loss Difference)
Iterations
0
1
2
3
4
0
20
40
60
80
100
120

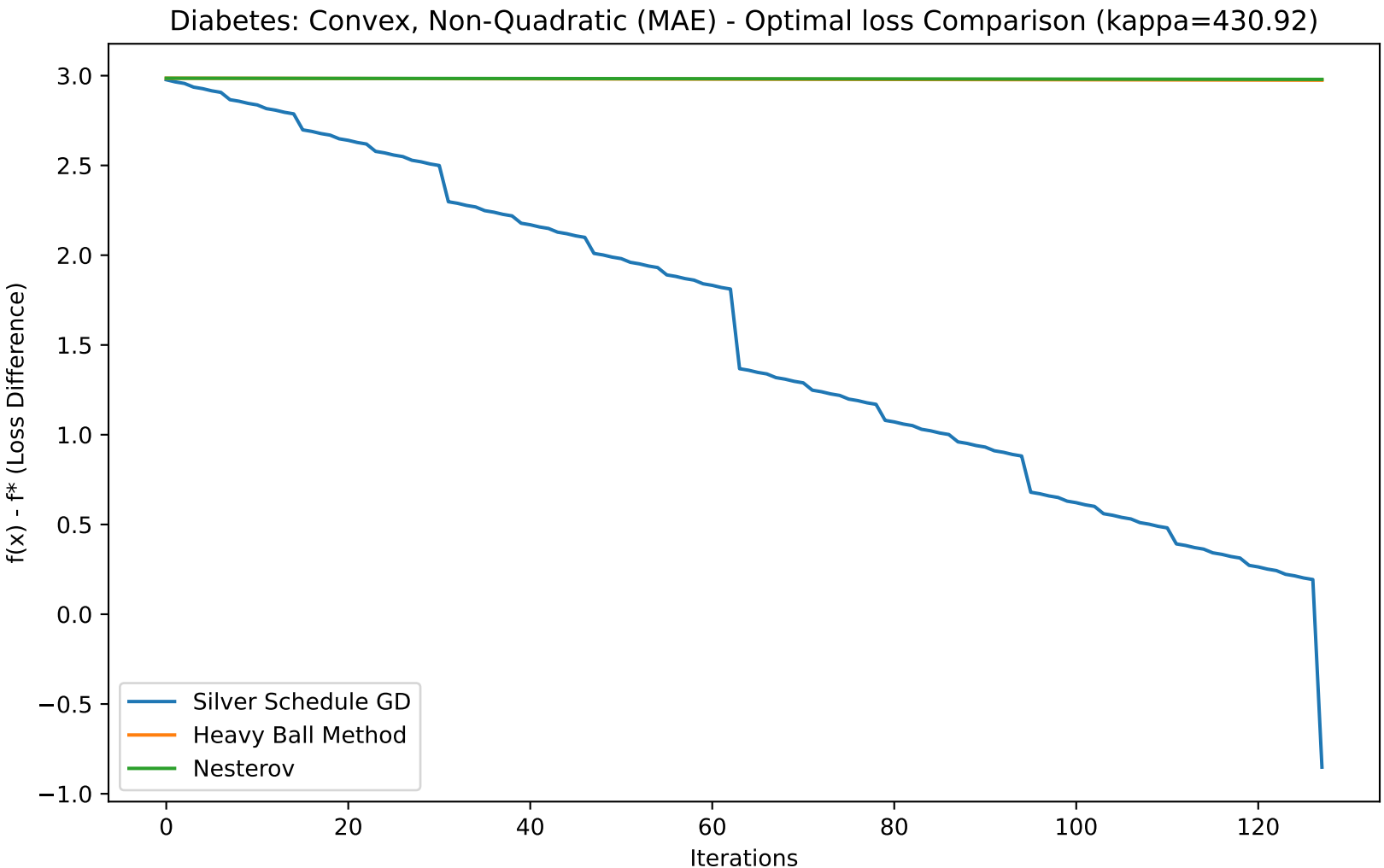

California Housing: Non-Convex (Sinusoidal) - Optimal Theta Comparison (kappa=43.80)
1e62
Silver Schedule GD
Heavy Ball Method
Nesterov
2.0
1.5
1.0
0.5
0.0
x - x* (Theta Difference)
0
20
40
60
80
100
120
Iterations

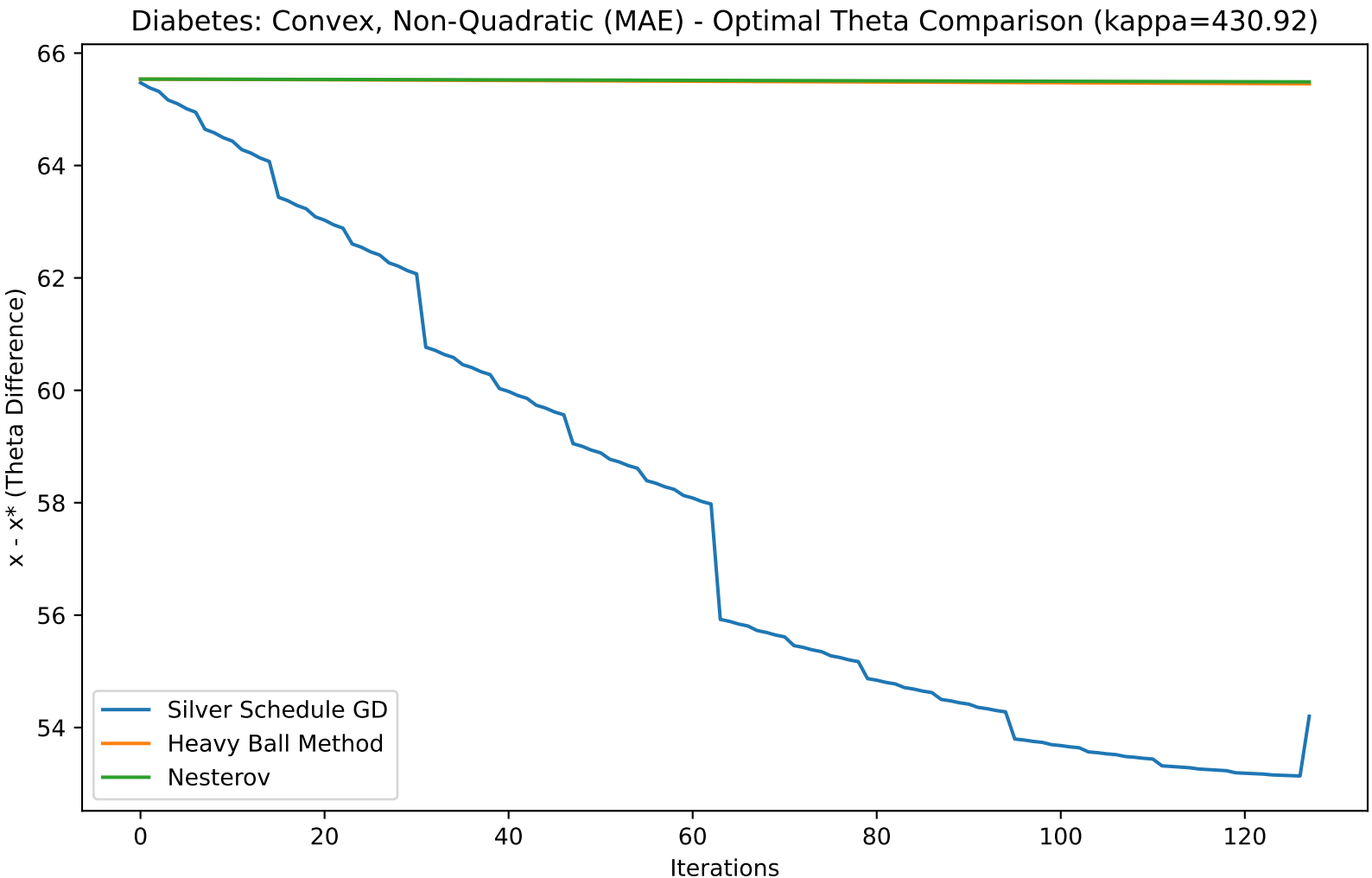

Diabetes: Quadratic & Convex (MSE) - Loss Comparison (kappa=430.92)
1e303
Silver Schedule GD
Heavy Ball Method
Nesterov
2.5
2.0
1.5
1.0
0.5
0.0
Loss
0
20
40
60
80
100
120
Iterations

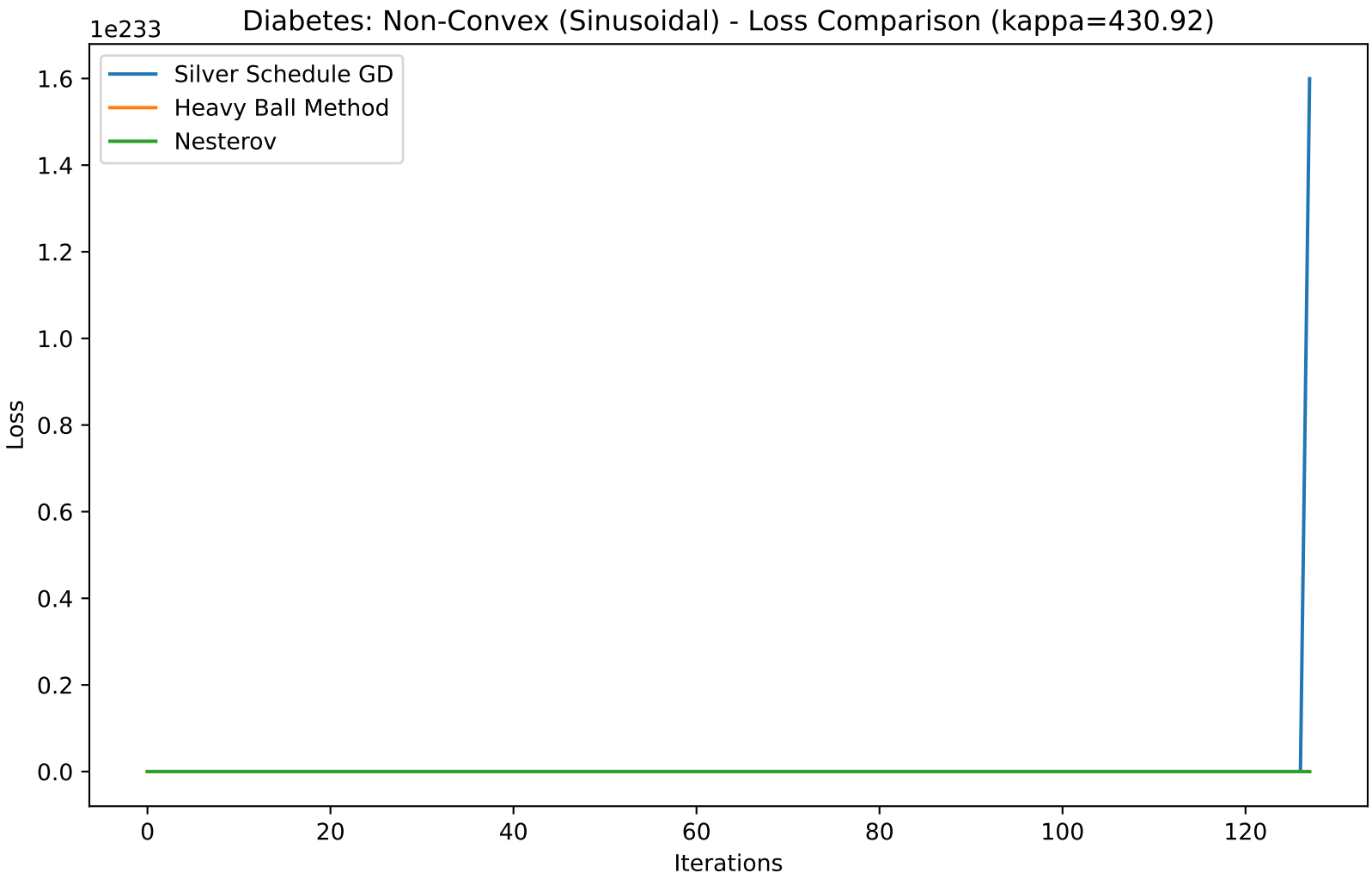

Diabetes: Quadratic & Convex (MSE) - Optimal loss Comparison (kappa=430.92)
1e303
Silver Schedule GD
Heavy Ball Method
Nesterov
f(x) - f* (Loss Difference)
Iterations
0.0
0.5
1.0
1.5
2.0
2.5
0
20
40
60
80
100
120

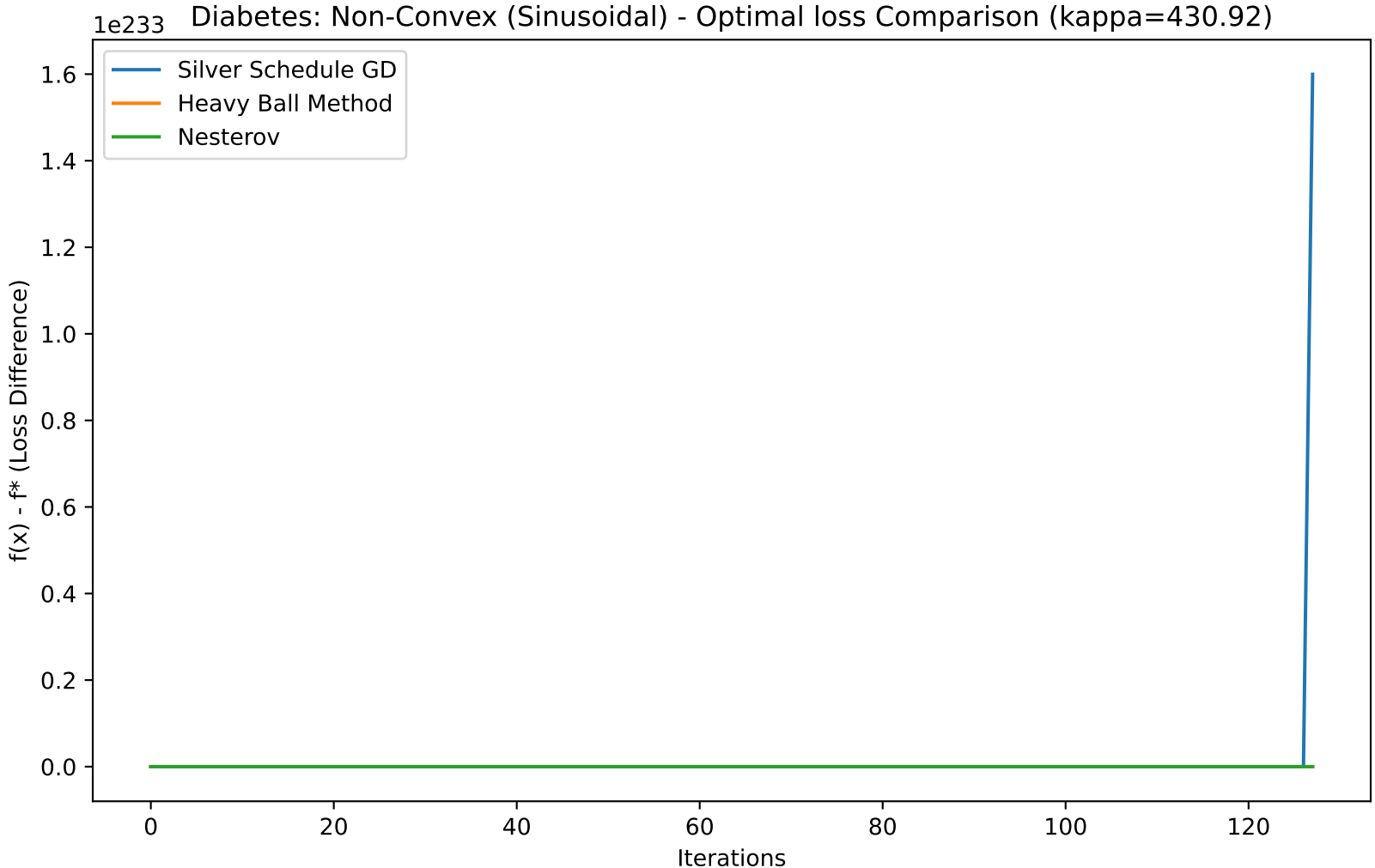

Diabetes: Quadratic & Convex (MSE) - Optimal Theta Comparison (kappa=430.92)
1e153
Silver Schedule GD
Heavy Ball Method
Nesterov
x - x* (Theta Difference)
Iterations
0
1
2
3
4
5
6
7
0
20
40
60
80
100
120

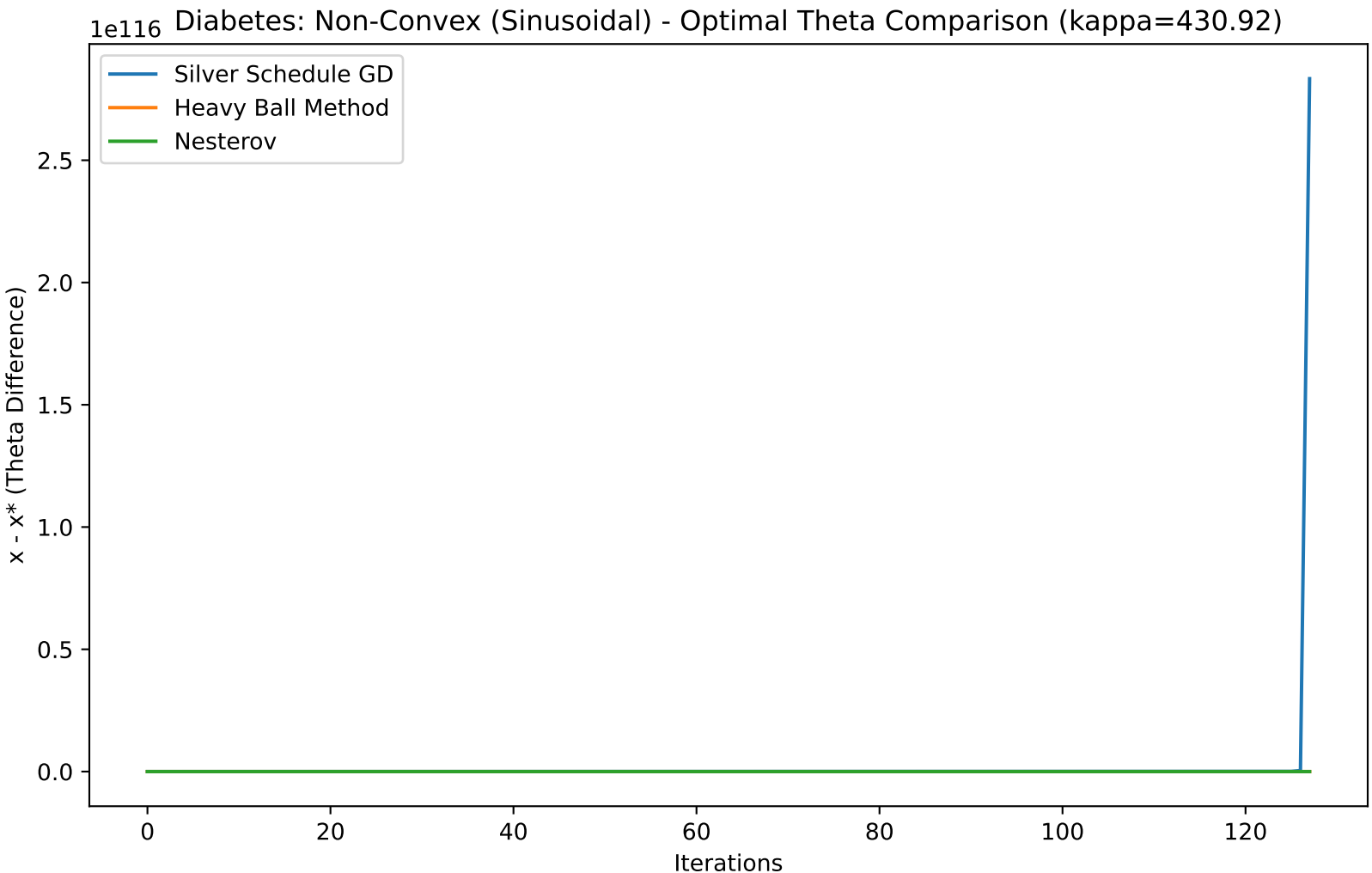

Diabetes: Convex, Non-Quadratic (MAE) - Loss Comparison (kappa=430.92)
Loss
Iterations
153.5
153.0
152.5
152.0
151.5
151.0
150.5
150.0
0
20
40
60
80
100
120
Silver Schedule GD
Heavy Ball Method
Nesterov

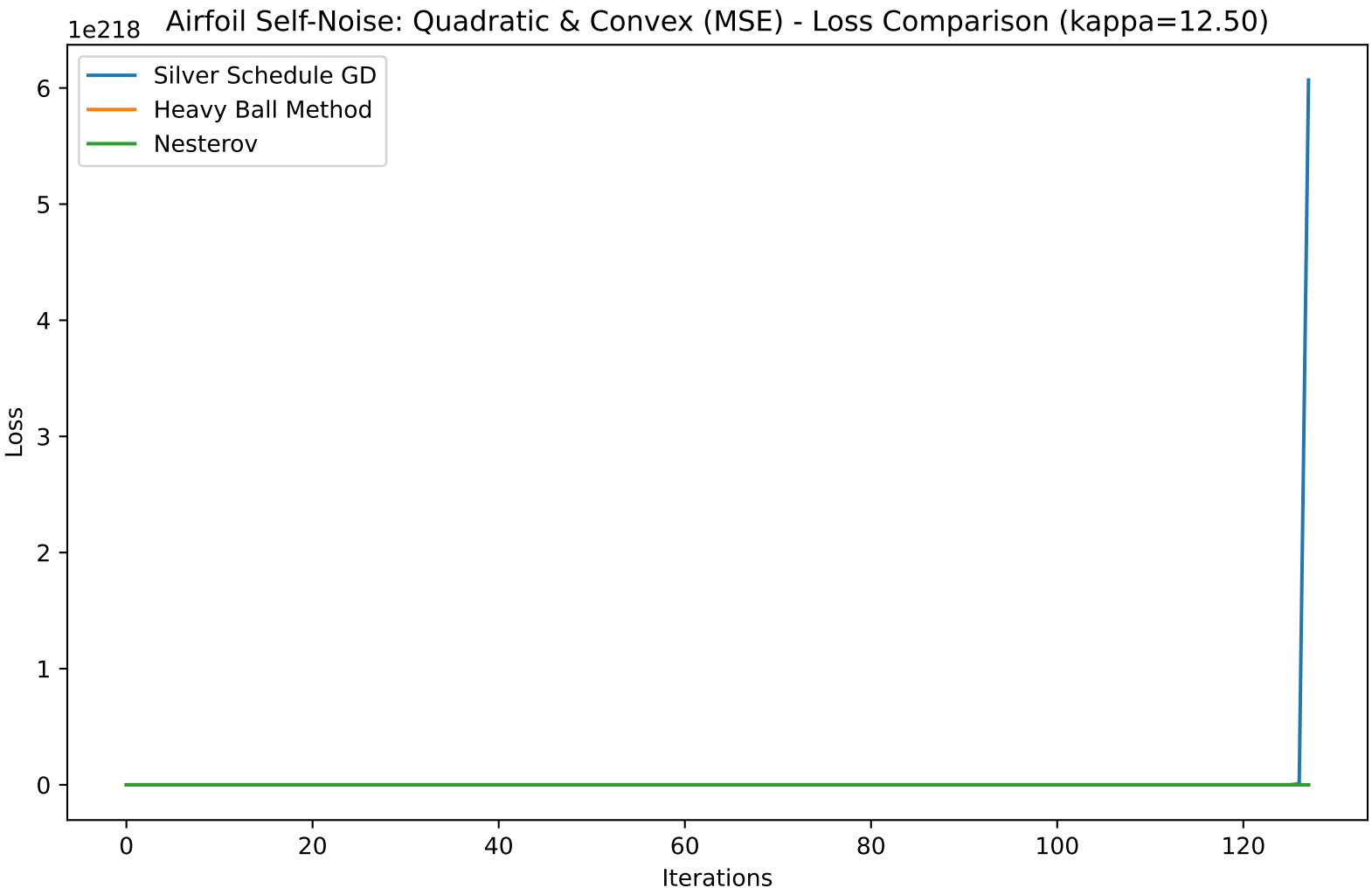

Diabetes: Convex, Non-Quadratic (MAE) - Optimal loss Comparison (kappa=430.92)
f(x) - f* (Loss Difference)
Iterations
Silver Schedule GD
Heavy Ball Method
Nesterov
3.0
2.5
2.0
1.5
1.0
0.5
0.0
−0.5
−1.0
0
20
40
60
80
100
120

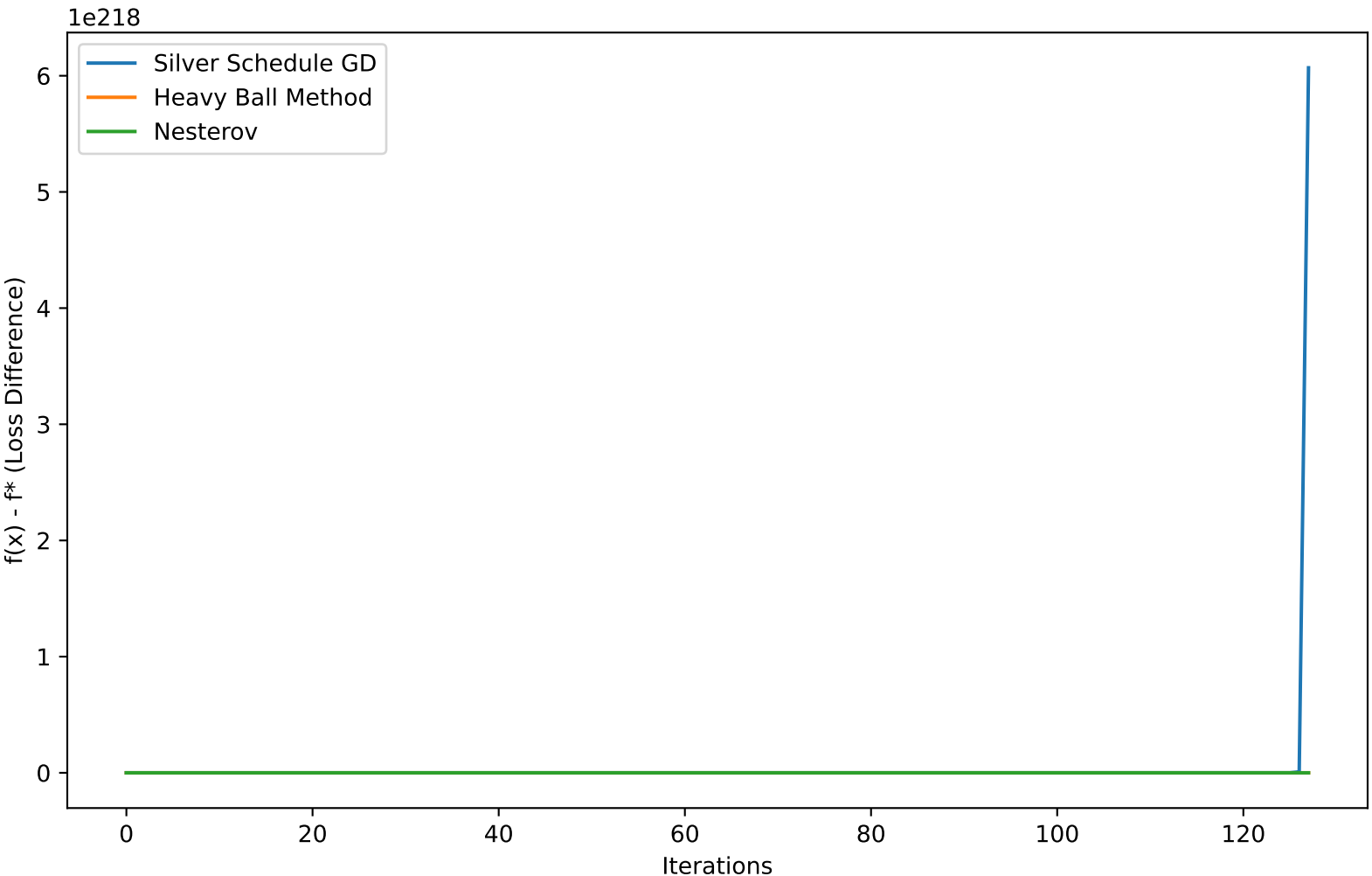

Diabetes: Convex, Non-Quadratic (MAE) - Optimal Theta Comparison (kappa=430.92)
x - x* (Theta Difference)
Iterations
66
64
62
60
58
56
54
0
20
40
60
80
100
120
Silver Schedule GD
Heavy Ball Method
Nesterov

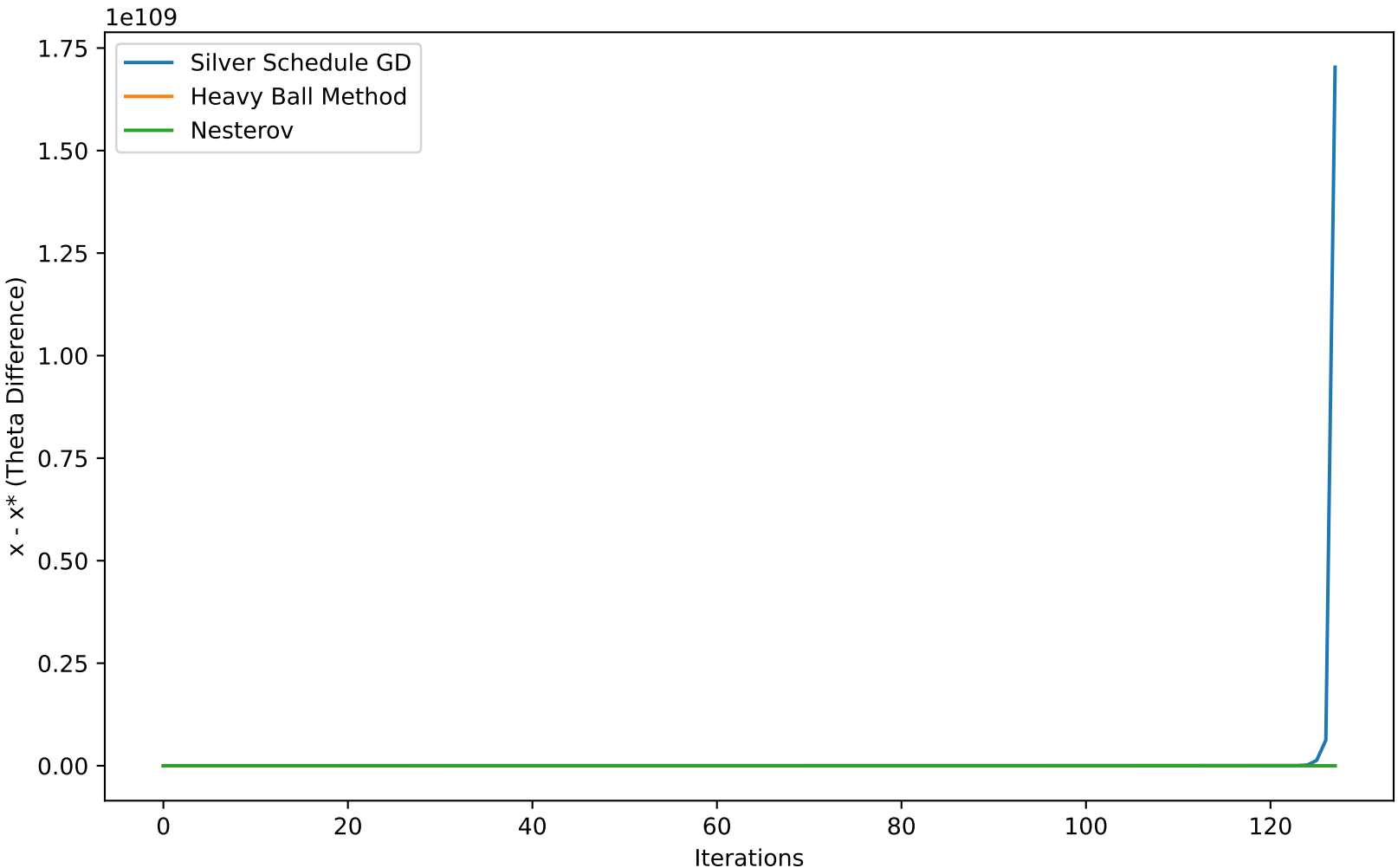

Diabetes: Non-Convex (Sinusoidal) - Loss Comparison (kappa=430.92)
1e233
Silver Schedule GD
Heavy Ball Method
Nesterov
1.6
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
Loss
0
20
40
60
80
100
120
Iterations

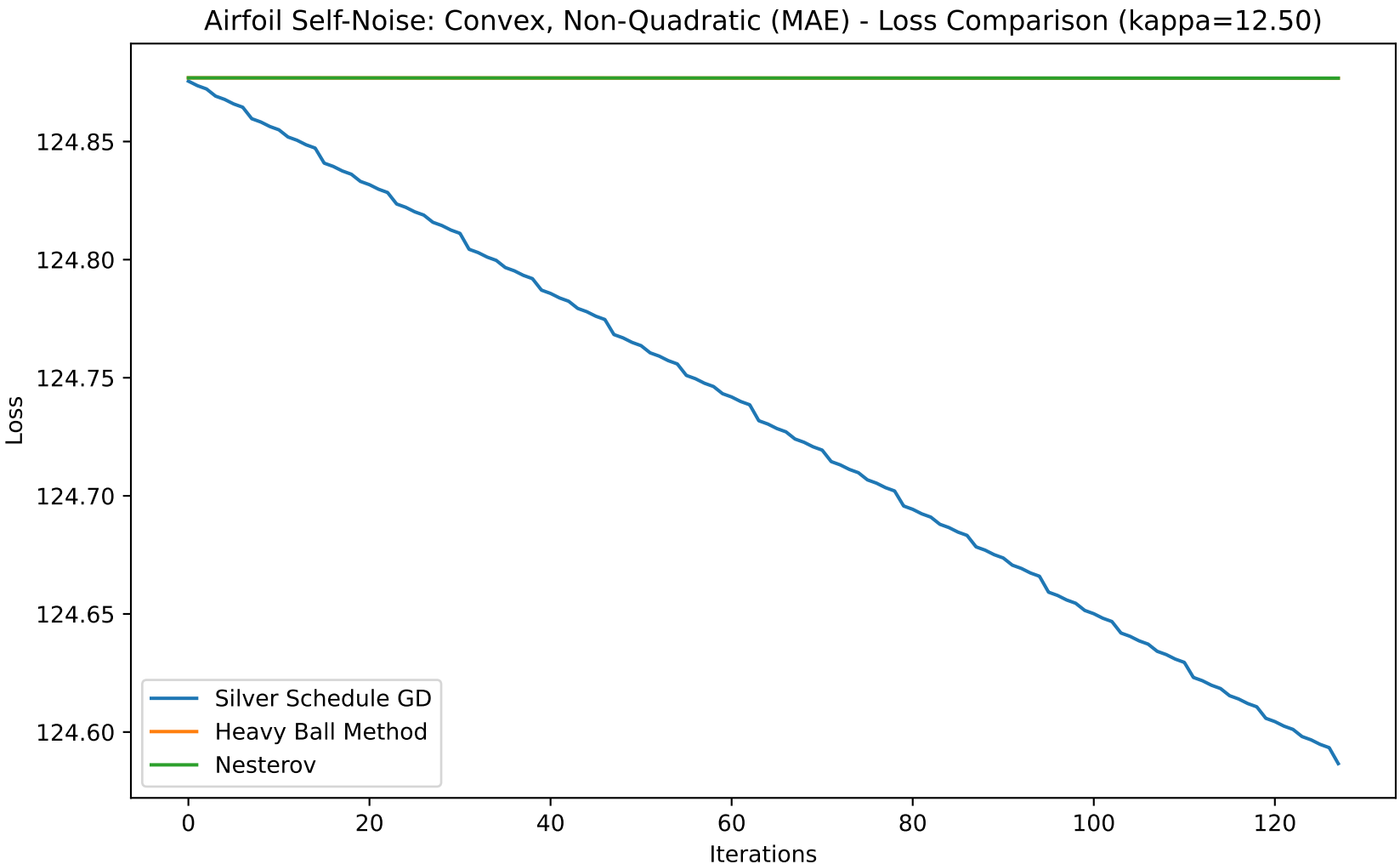

Diabetes: Non-Convex (Sinusoidal) - Optimal loss Comparison (kappa=430.92)
1e233
Silver Schedule GD
Heavy Ball Method
Nesterov
f(x) - f* (Loss Difference)
Iterations
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1.6
0
20
40
60
80
100
120

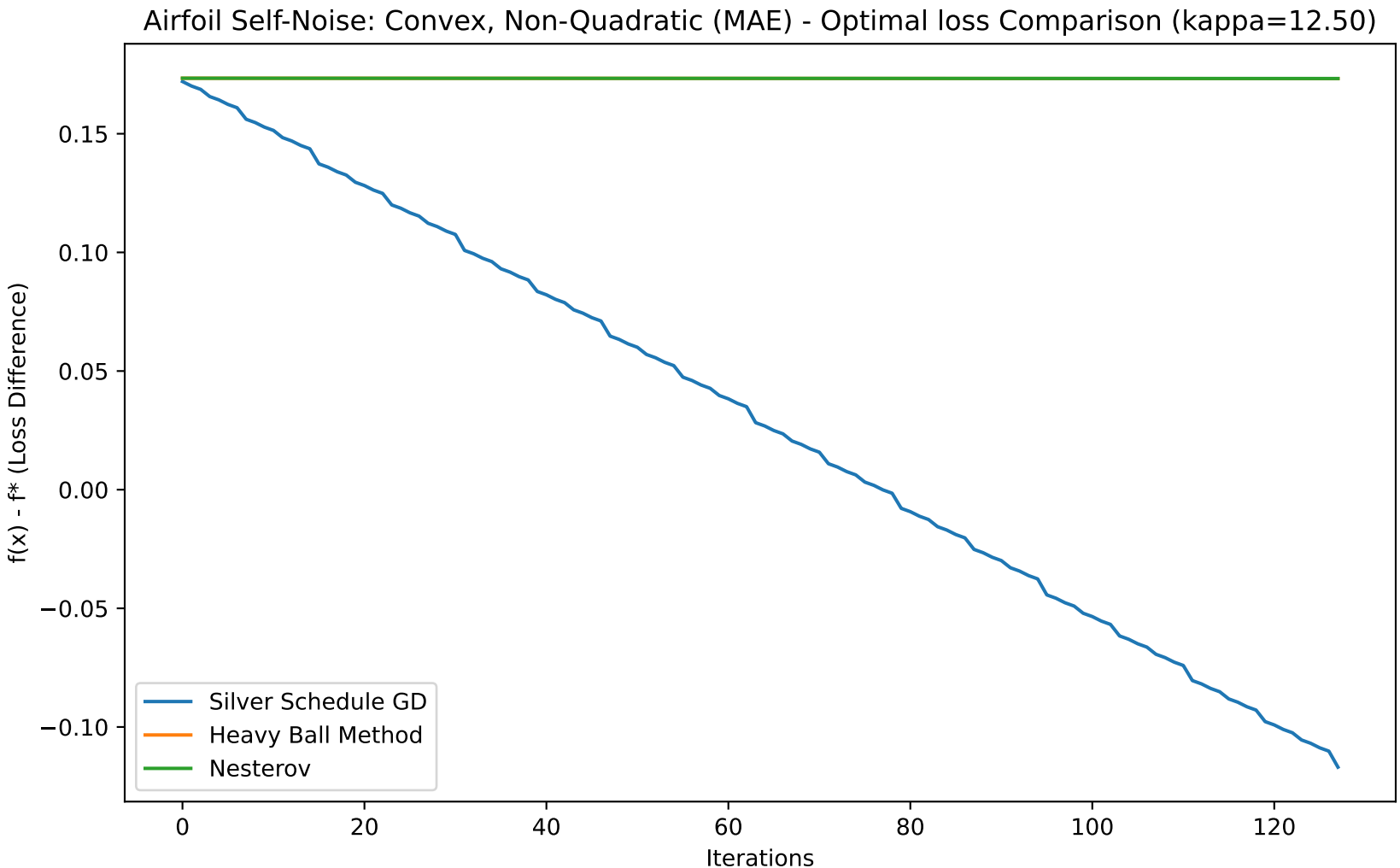

Diabetes: Non-Convex (Sinusoidal) - Optimal Theta Comparison (kappa=430.92)
1e116
Silver Schedule GD
Heavy Ball Method
Nesterov
x - x* (Theta Difference)
Iterations
0.0
0.5
1.0
1.5
2.0
2.5
0
20
40
60
80
100
120

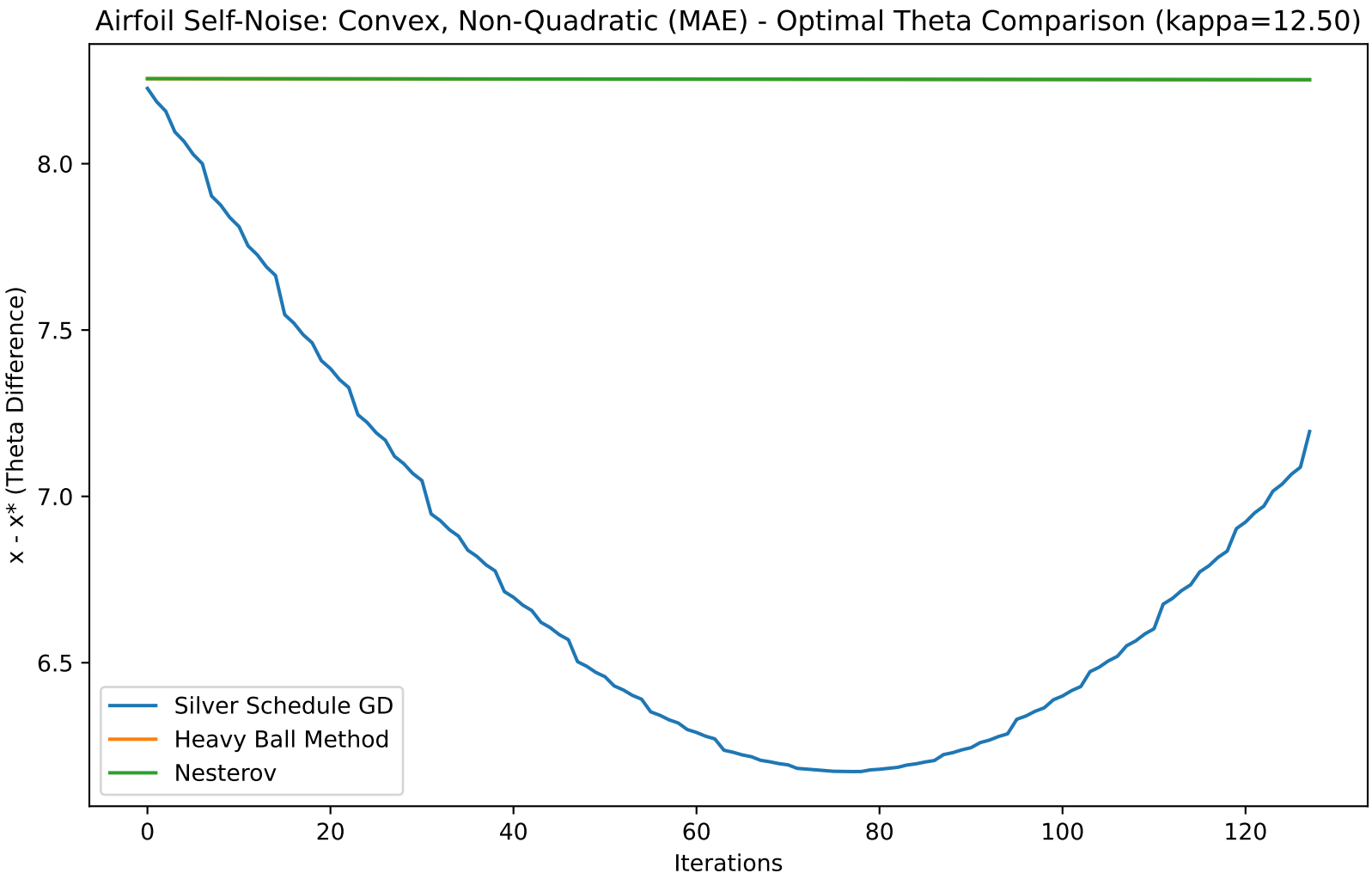

Airfoil Self-Noise: Quadratic & Convex (MSE) - Loss Comparison (kappa=12.50)
1e218
Silver Schedule GD
Heavy Ball Method
Nesterov
Loss
Iterations
0
1
2
3
4
5
6
0
20
40
60
80
100
120

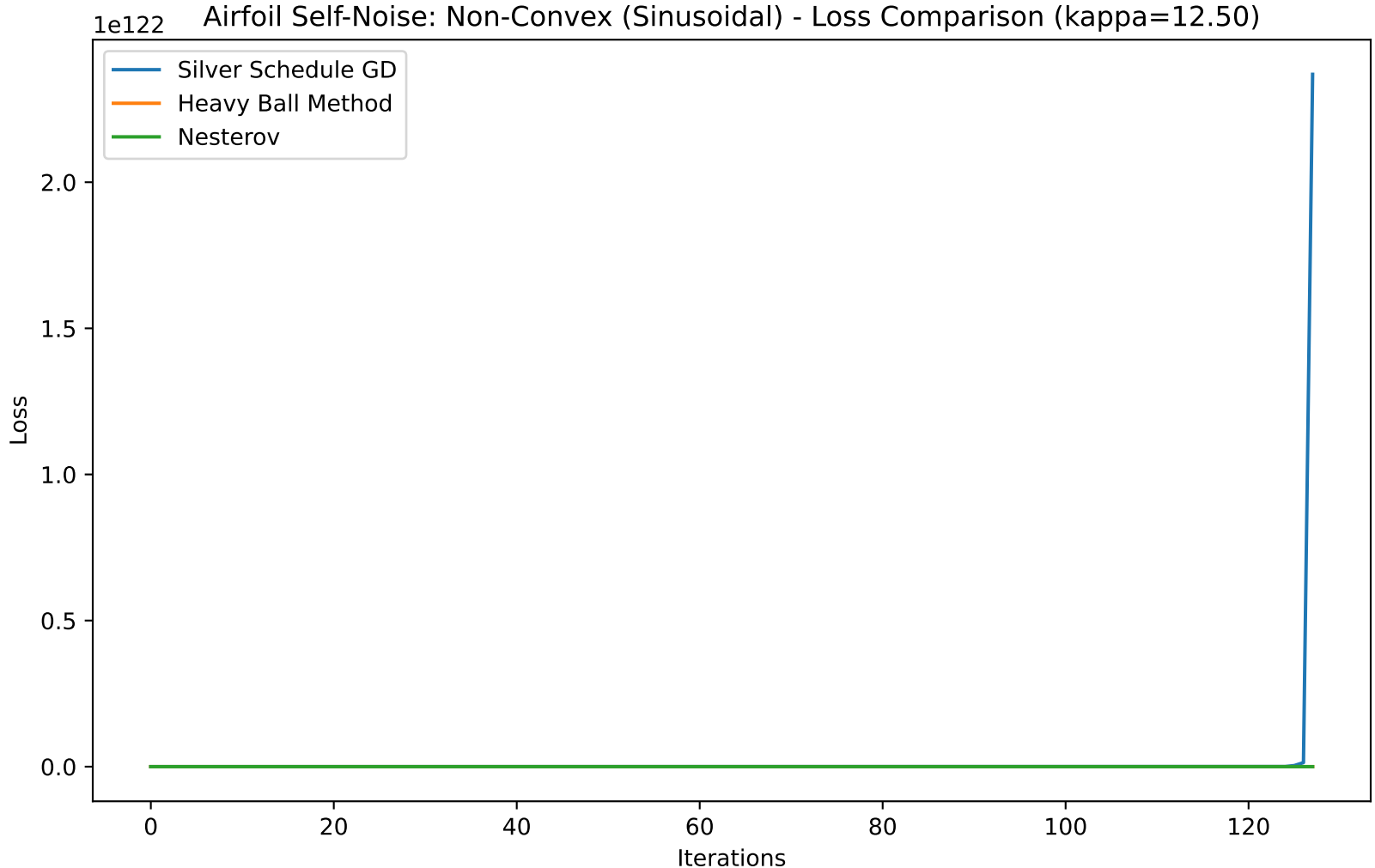

Airfoil Self-Noise: Quadratic & Convex (MSE) - Optimal loss Comparison (kappa=12.50)
1e218
Silver Schedule GD
Heavy Ball Method
Nesterov
f(x) - f* (Loss Difference)
Iterations
0
1
2
3
4
5
6
0
20
40
60
80
100
120

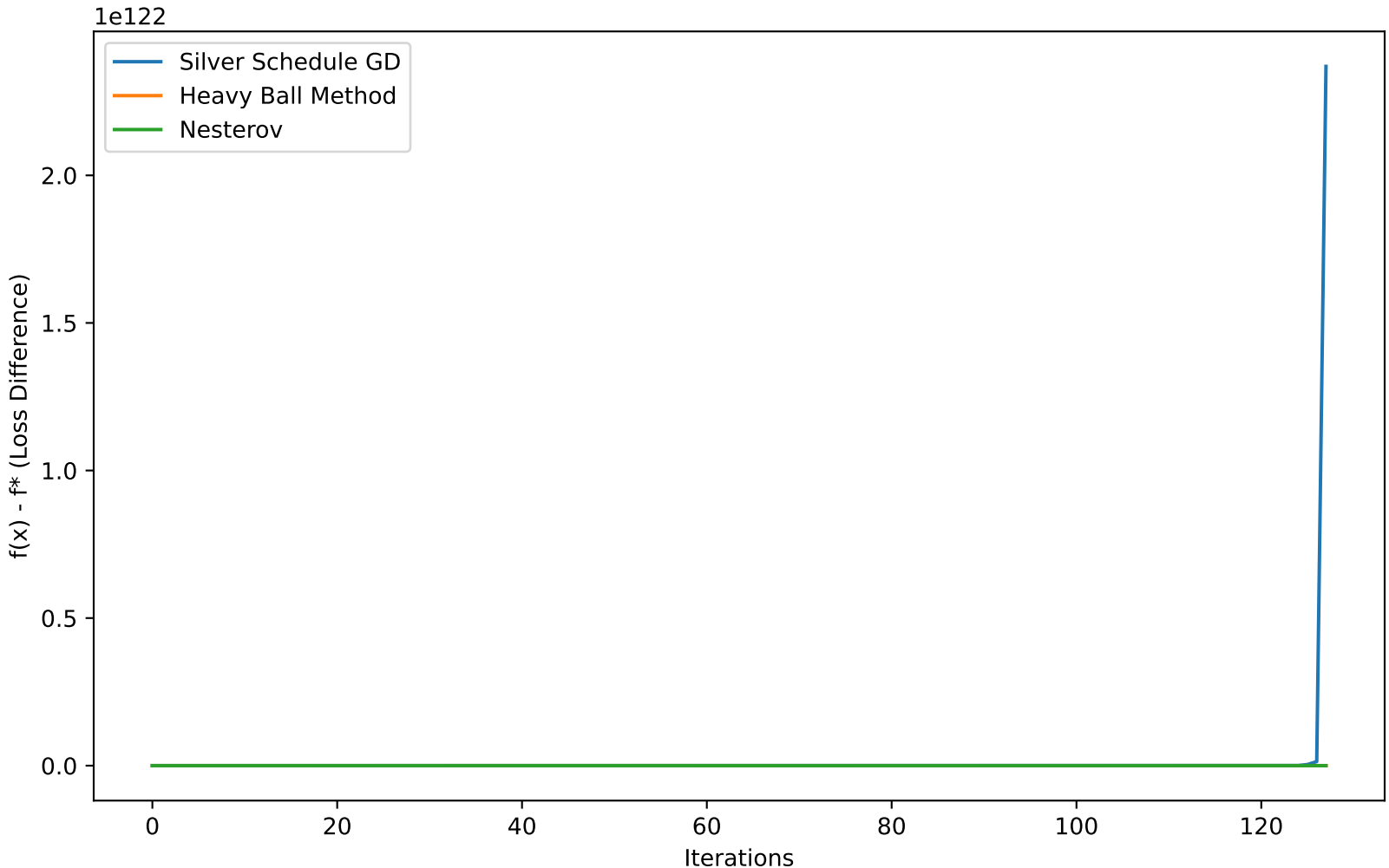

Airfoil Self-Noise: Quadratic & Convex (MSE) - Optimal Theta Comparison (kappa=12.50)
1e109
1.75
1.50
1.25
1.00
0.75
0.50
0.25
0.00
x - x* (Theta Difference)
Silver Schedule GD
Heavy Ball Method
Nesterov
0
20
40
60
80
100
120
Iterations

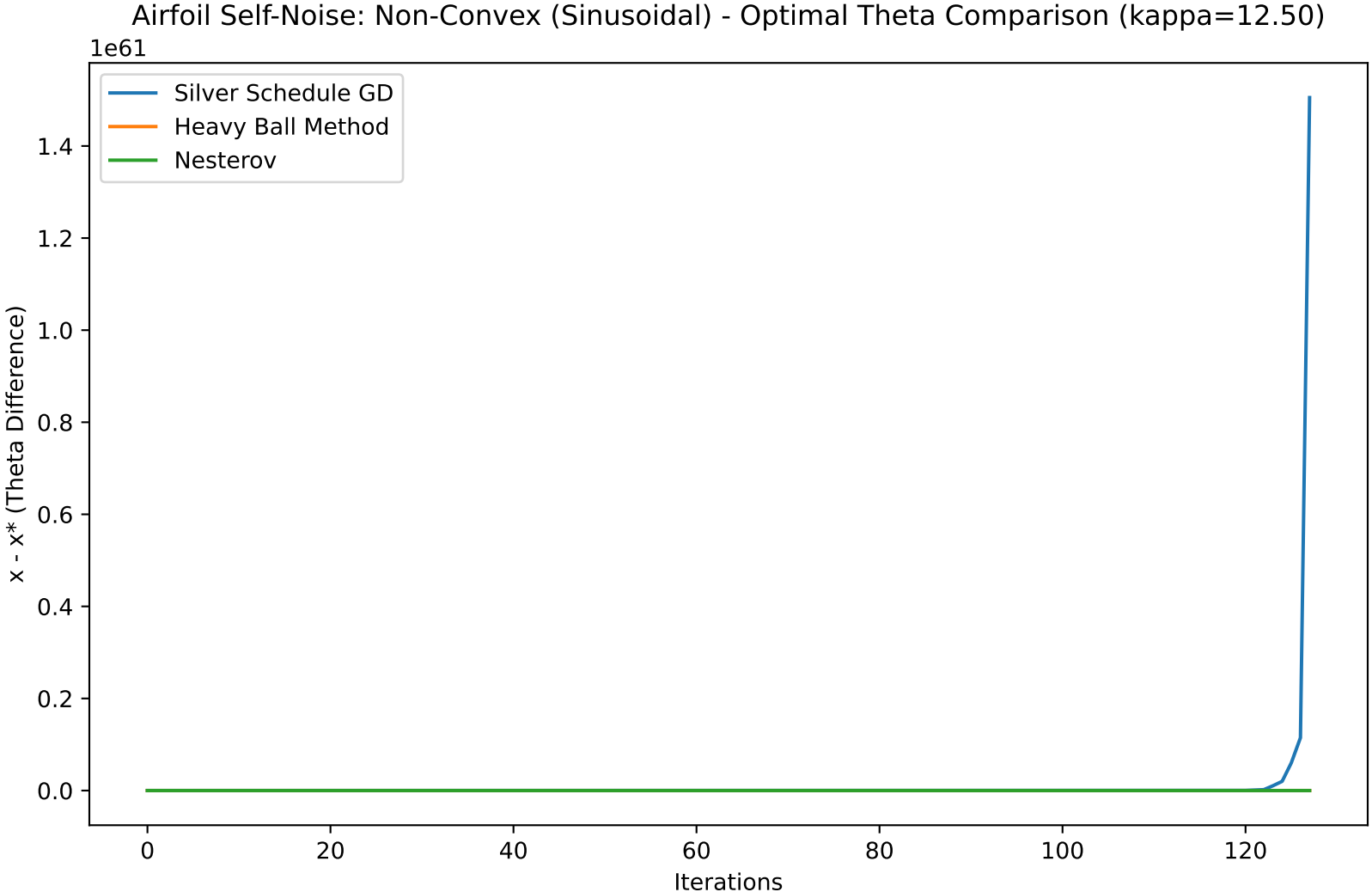

Airfoil Self-Noise: Convex, Non-Quadratic (MAE) - Loss Comparison (kappa=12.50)
Loss
124.85
124.80
124.75
124.70
124.65
124.60
0
20
40
60
80
100
120
Iterations
Silver Schedule GD
Heavy Ball Method
Nesterov

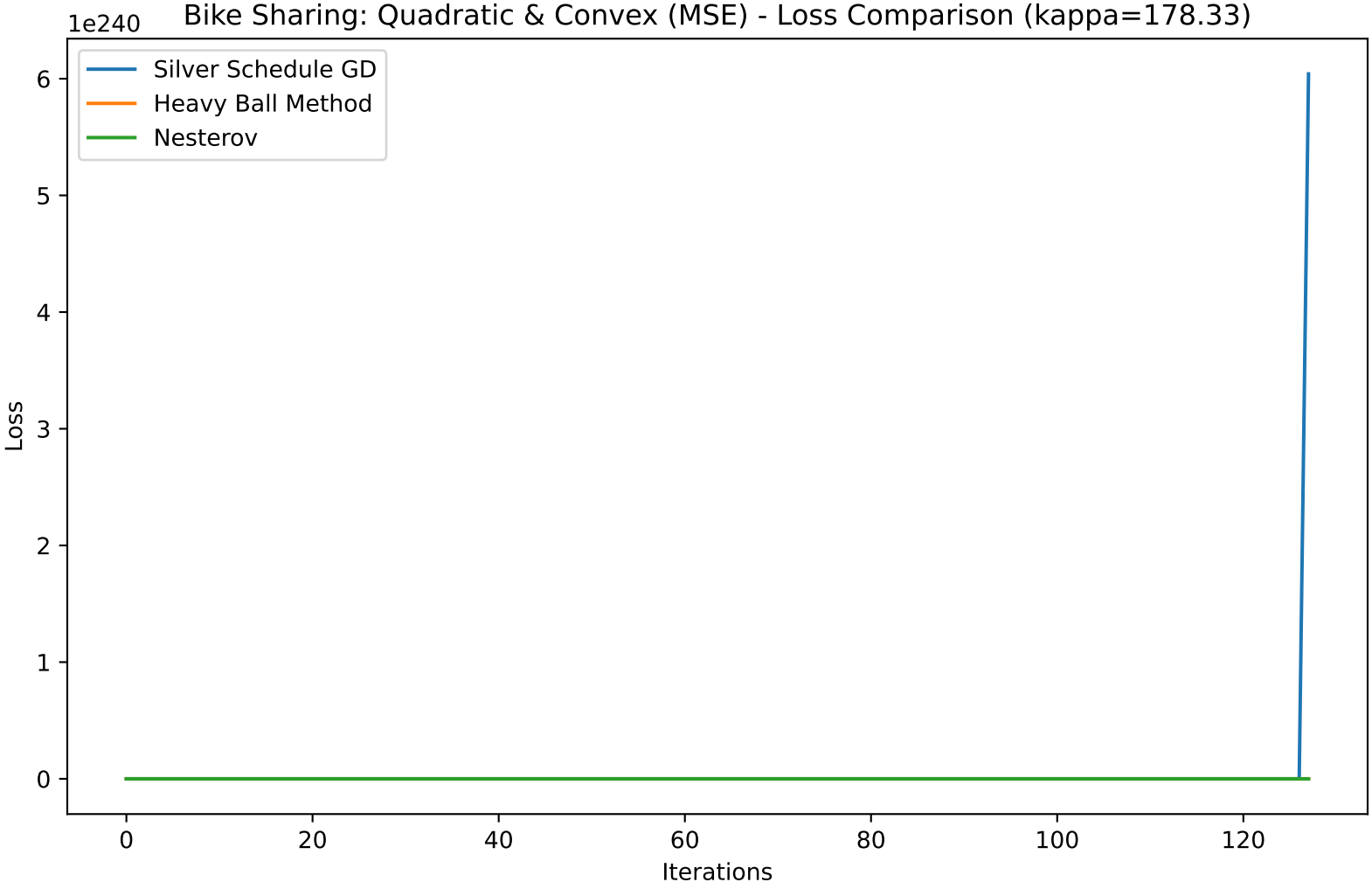

Airfoil Self-Noise: Convex, Non-Quadratic (MAE) - Optimal loss Comparison (kappa=12.50)
f(x) - f* (Loss Difference)
0.15
0.10
0.05
0.00
−0.05
−0.10
0
20
40
60
80
100
120
Iterations
Silver Schedule GD
Heavy Ball Method
Nesterov

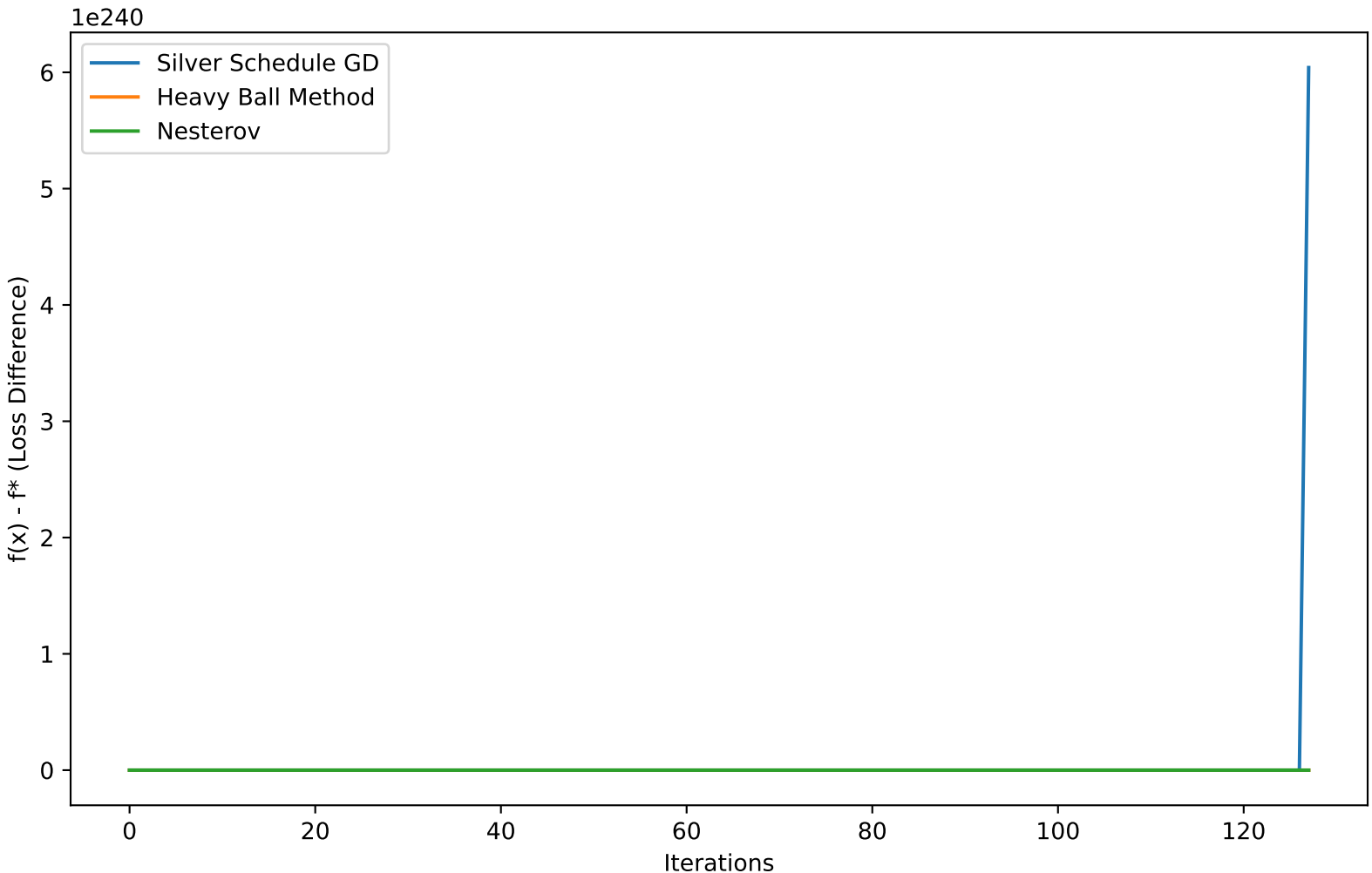

Airfoil Self-Noise: Convex, Non-Quadratic (MAE) - Optimal Theta Comparison (kappa=12.50)
x - x* (Theta Difference)
8.0
7.5
7.0
6.5
0
20
40
60
80
100
120
Iterations
Silver Schedule GD
Heavy Ball Method
Nesterov

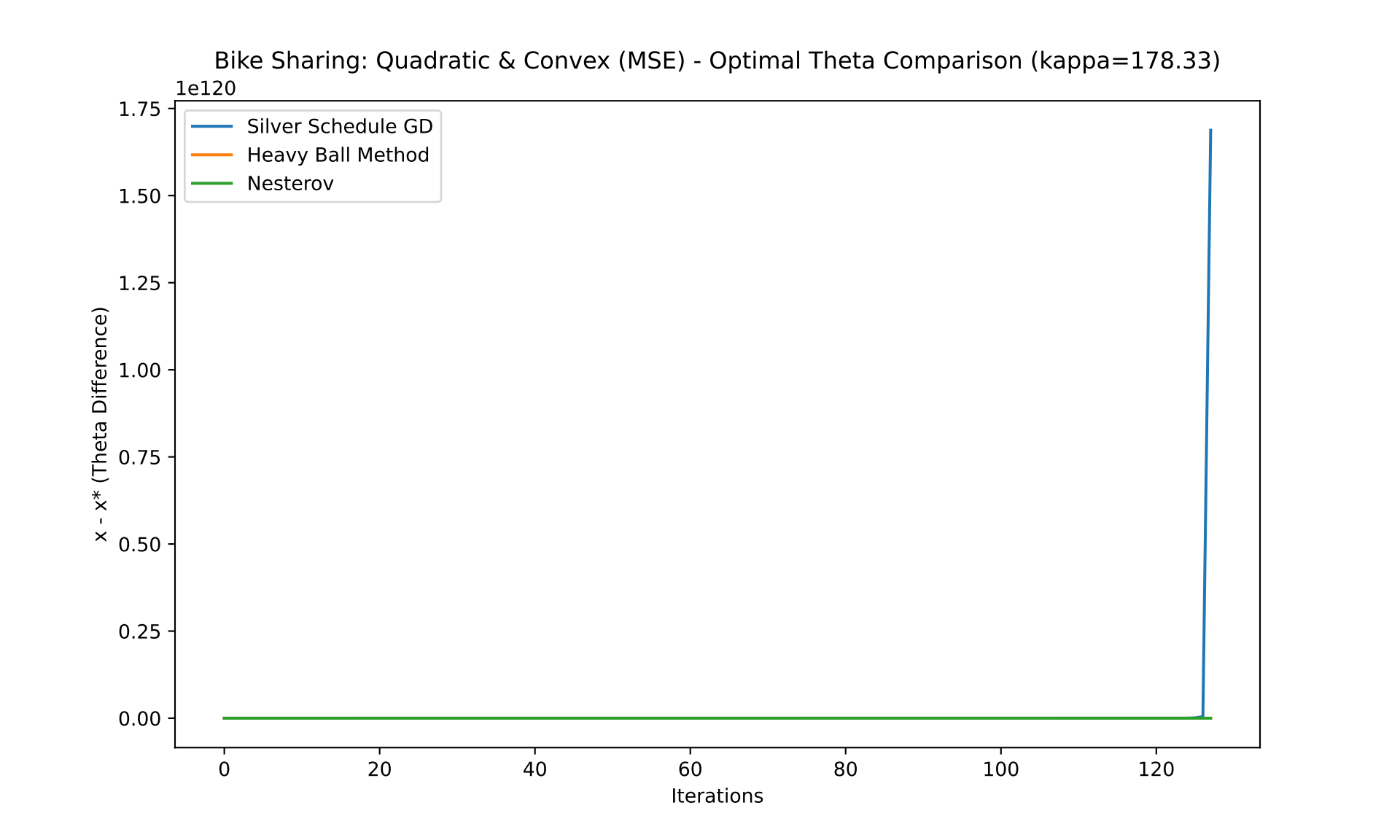

Airfoil Self-Noise: Non-Convex (Sinusoidal) - Loss Comparison (kappa=12.50)
1e122
Silver Schedule GD
Heavy Ball Method
Nesterov
2.0
1.5
1.0
0.5
0.0
Loss
0
20
40
60
80
100
120
Iterations

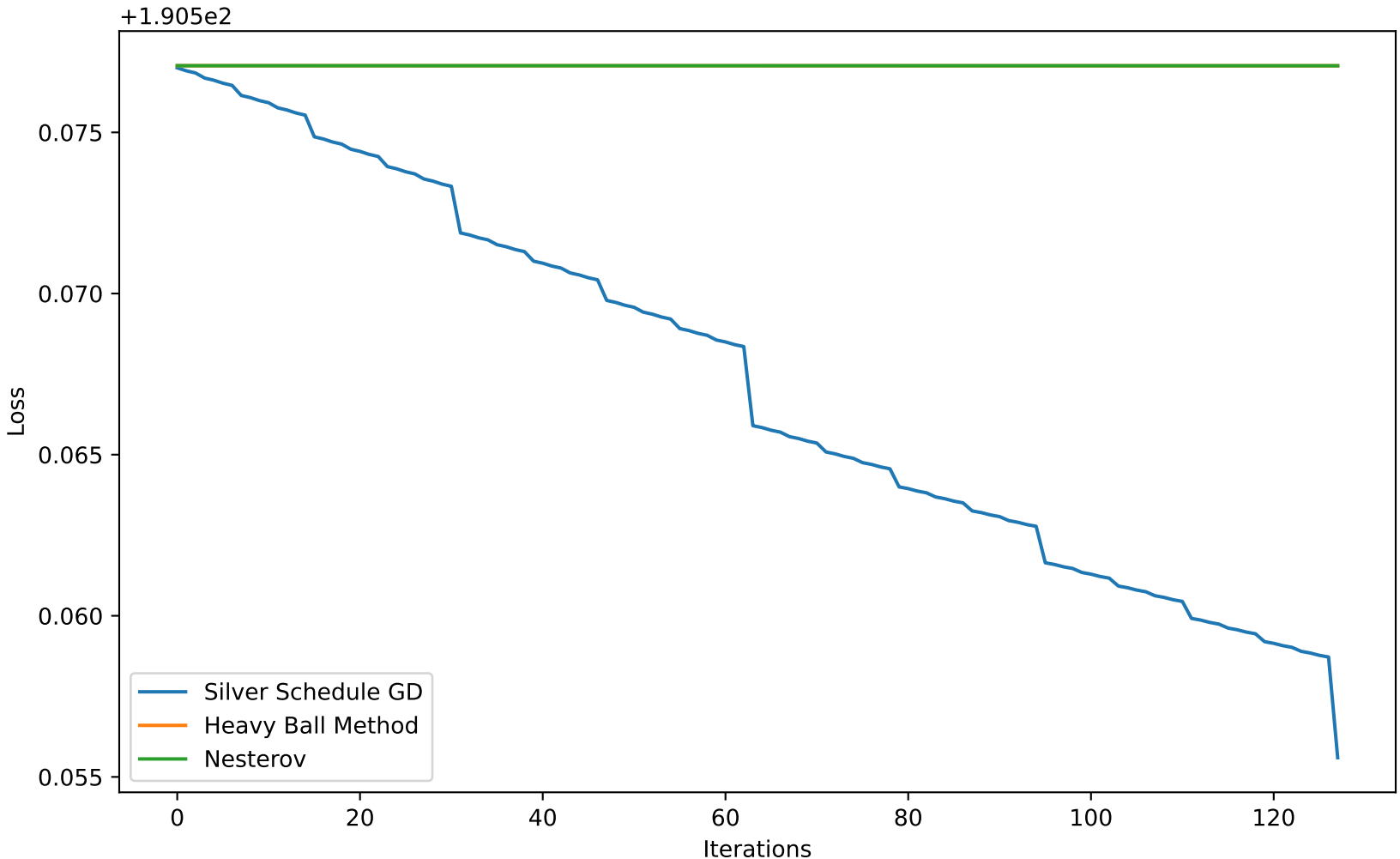

Airfoil Self-Noise: Non-Convex (Sinusoidal) - Optimal loss Comparison (kappa=12.50)
1e122
Silver Schedule GD
Heavy Ball Method
Nesterov
2.0
1.5
1.0
0.5
0.0
f(x) - f* (Loss Difference)
0
20
40
60
80
100
120
Iterations

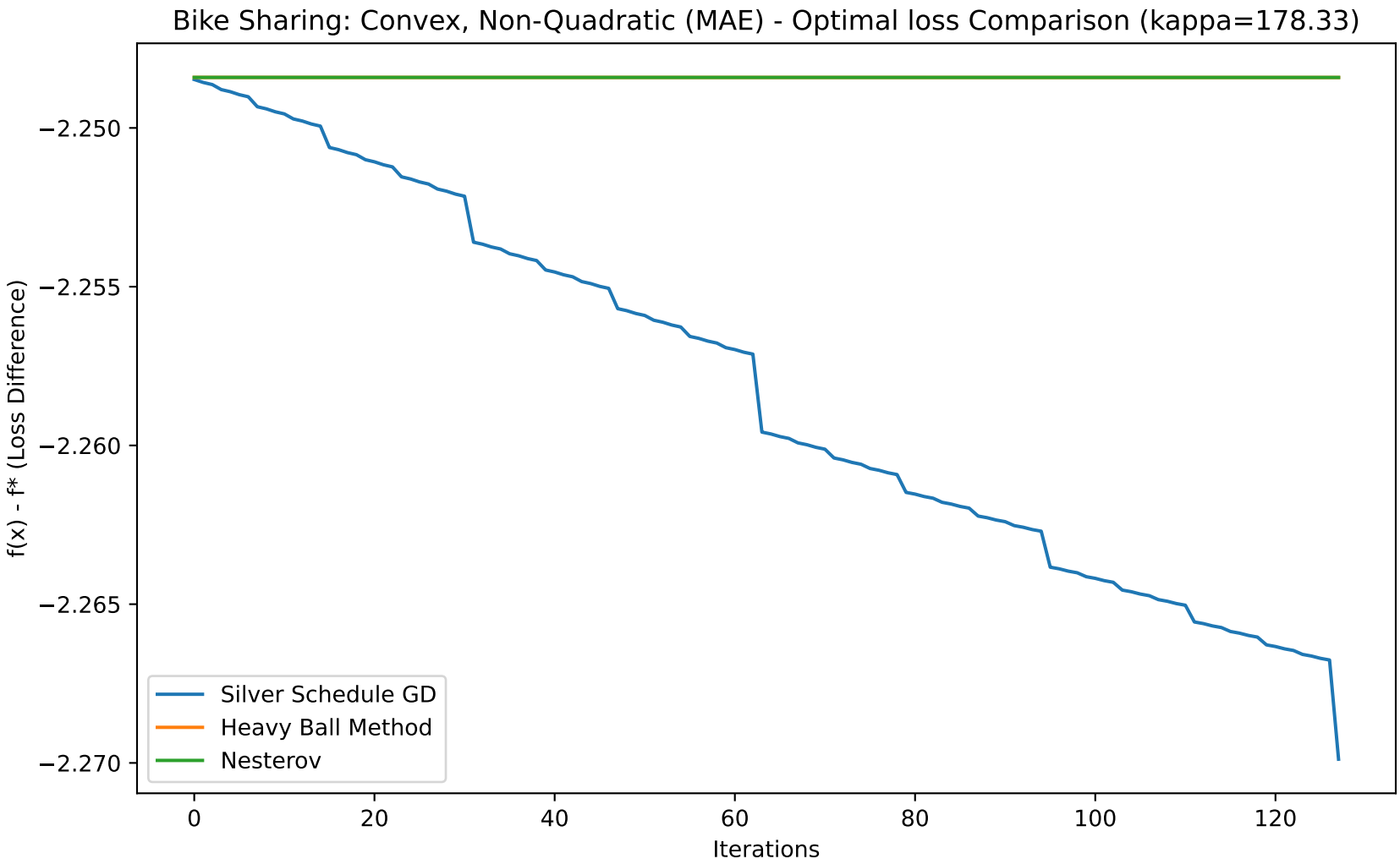

Airfoil Self-Noise: Non-Convex (Sinusoidal) - Optimal Theta Comparison (kappa=12.50)
1e61
Silver Schedule GD
Heavy Ball Method
Nesterov
x - x* (Theta Difference)
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
0
20
40
60
80
100
120
Iterations

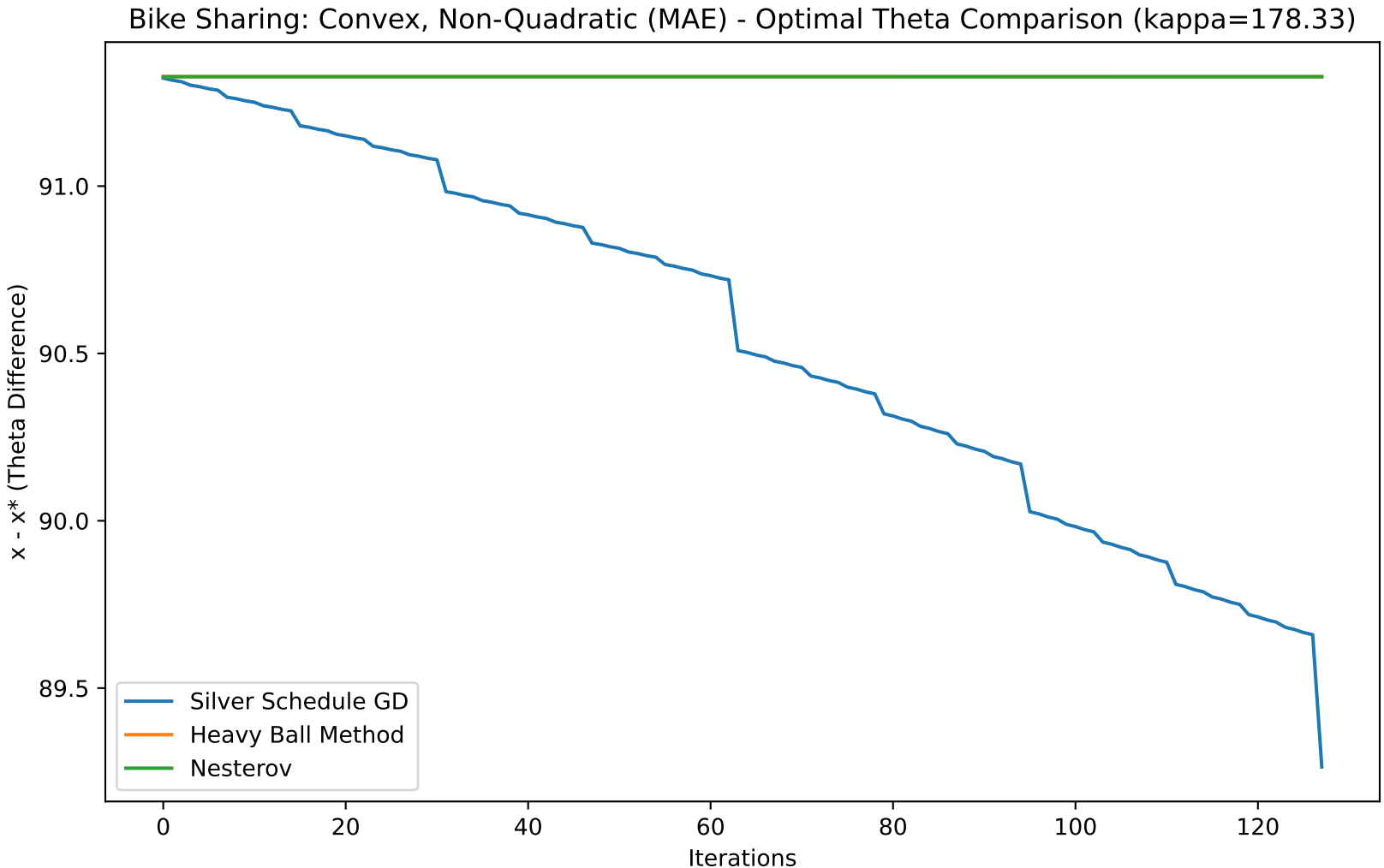

Bike Sharing: Quadratic & Convex (MSE) - Loss Comparison (kappa=178.33)
1e240
Silver Schedule GD
Heavy Ball Method
Nesterov
Loss
Iterations
0
1
2
3
4
5
6
0
20
40
60
80
100
120

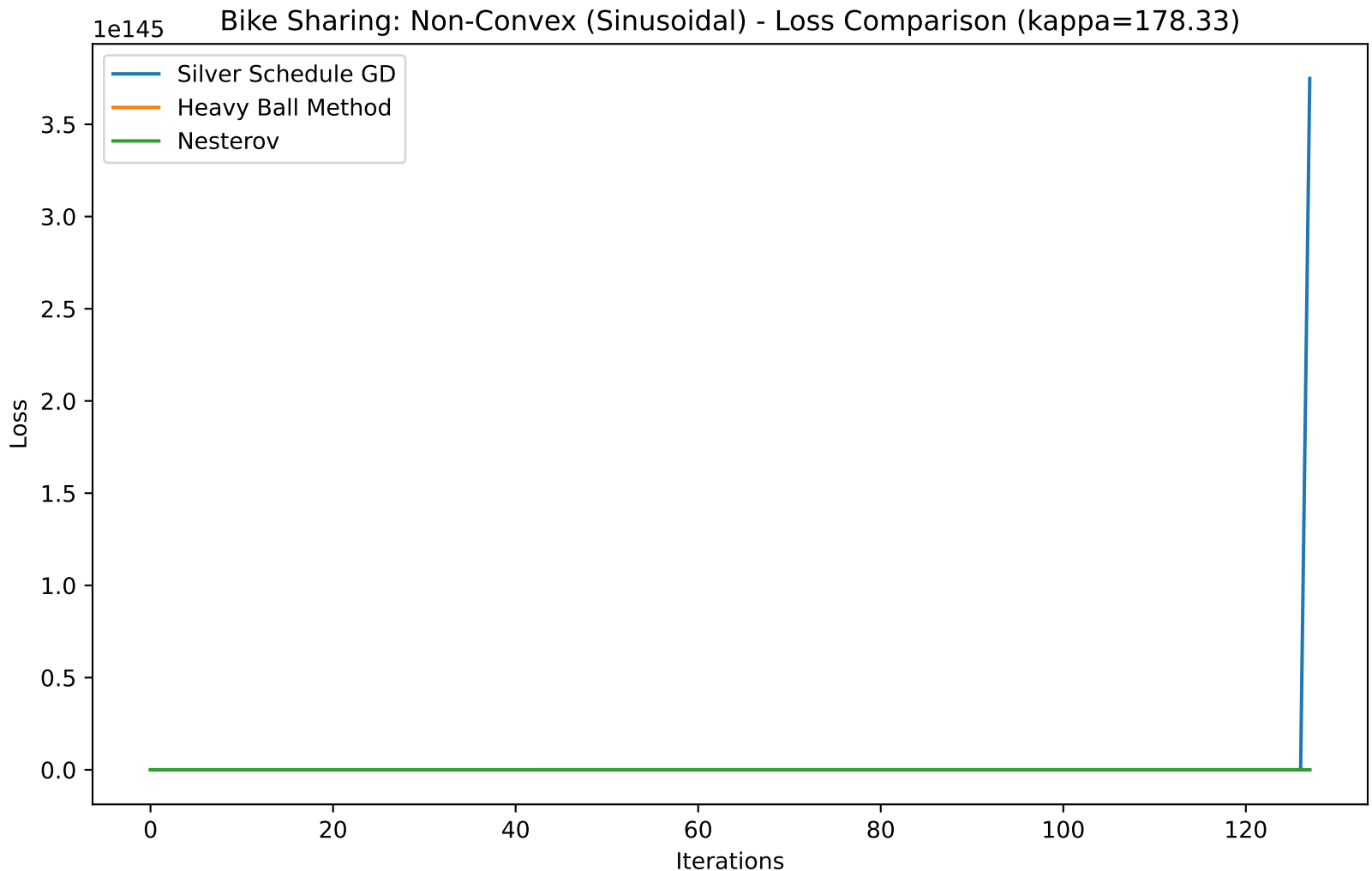

Bike Sharing: Quadratic & Convex (MSE) - Optimal loss Comparison (kappa=178.33)
1e240
Silver Schedule GD
Heavy Ball Method
Nesterov
f(x) - f* (Loss Difference)
Iterations
0
1
2
3
4
5
6
0
20
40
60
80
100
120

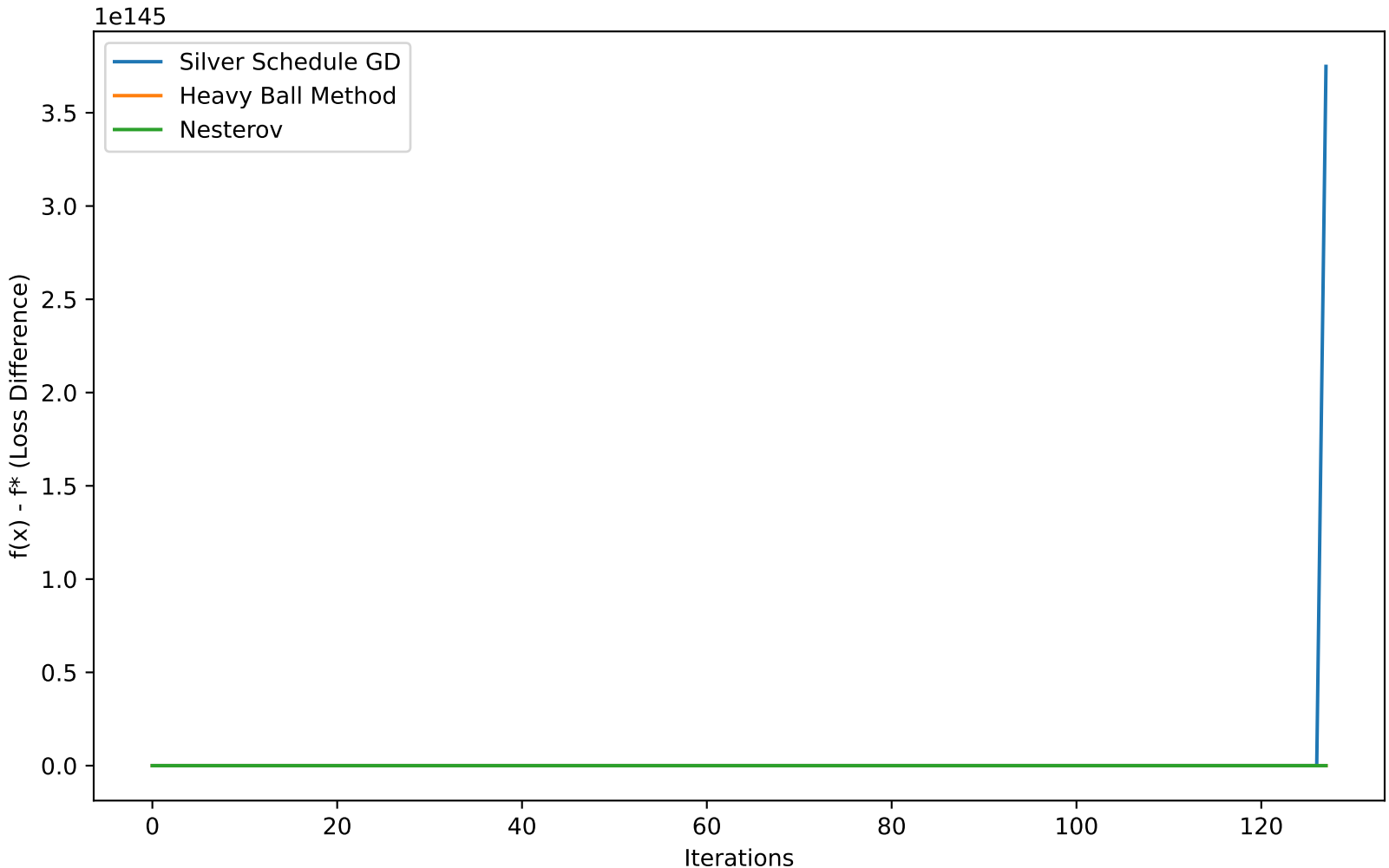

Bike Sharing: Quadratic & Convex (MSE) - Optimal Theta Comparison (kappa=178.33)
1e120
1.75
1.50
1.25
1.00
0.75
0.50
0.25
0.00
x - x* (Theta Difference)
Silver Schedule GD
Heavy Ball Method
Nesterov
0
20
40
60
80
100
120
Iterations

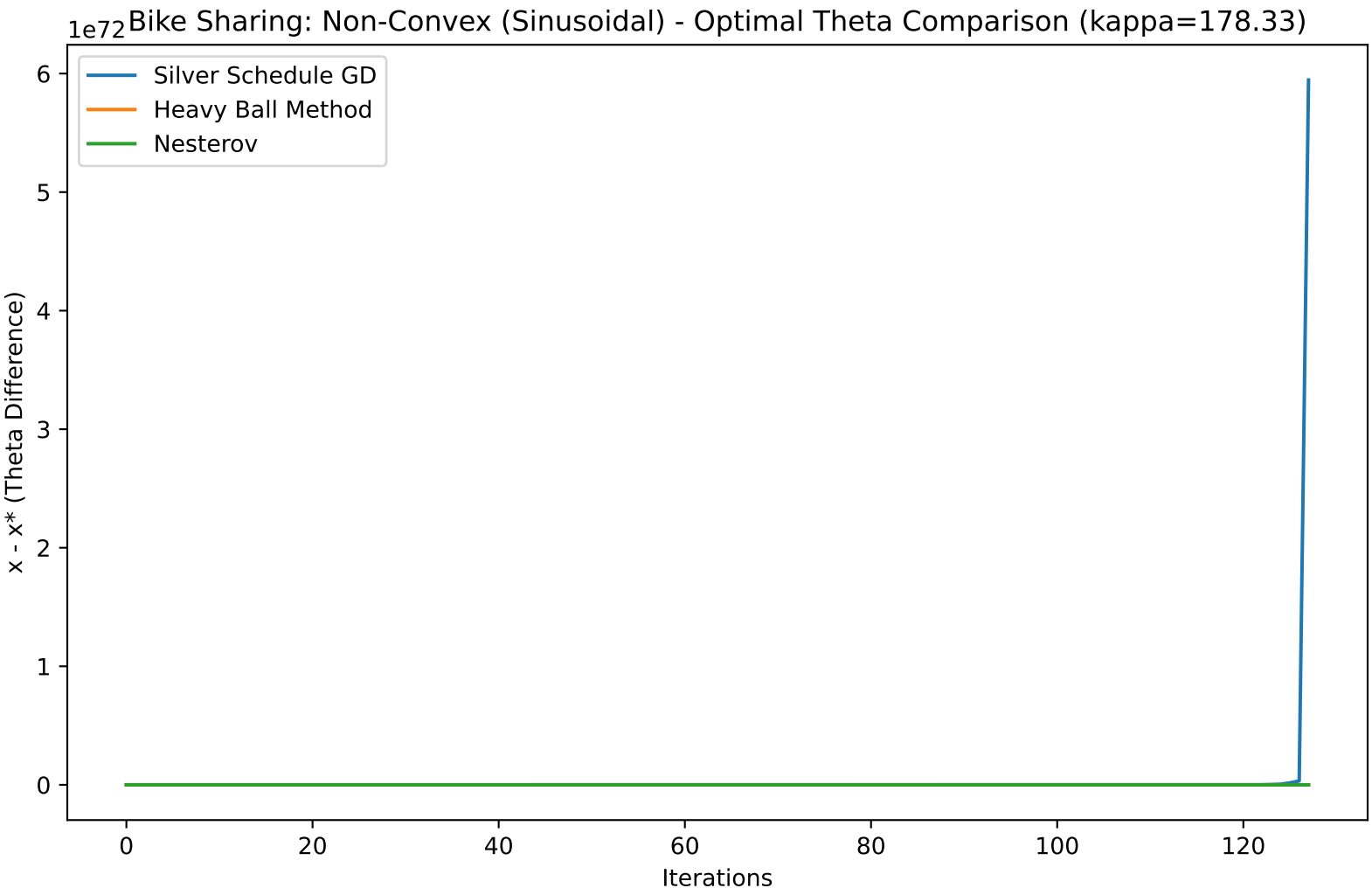

Bike Sharing: Convex, Non-Quadratic (MAE) - Loss Comparison (kappa=178.33)
+1.905e2
0.075
0.070
0.065
0.060
0.055
Loss
0
20
40
60
80
100
120
Iterations
Silver Schedule GD
Heavy Ball Method
Nesterov

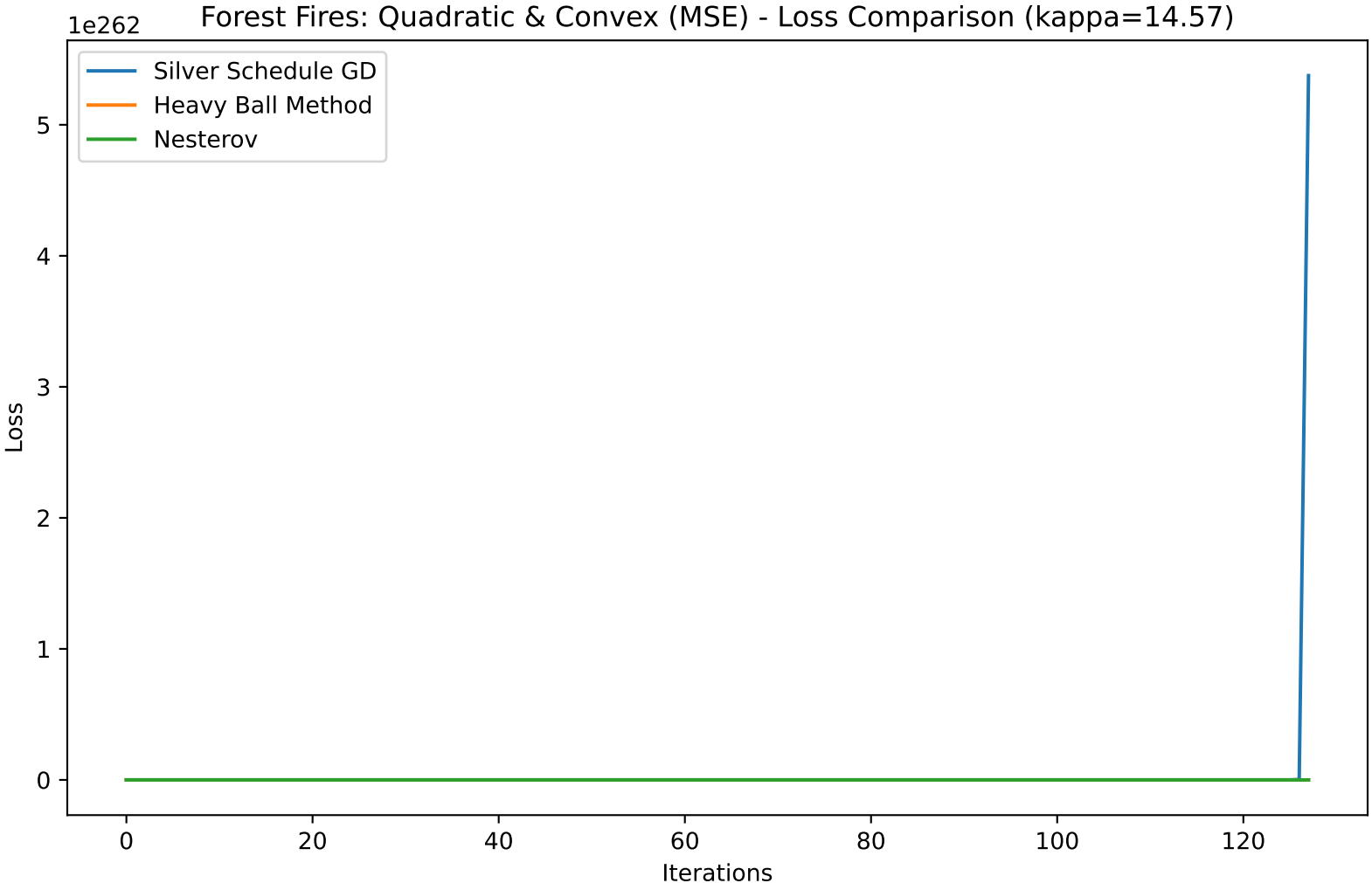

Bike Sharing: Convex, Non-Quadratic (MAE) - Optimal loss Comparison (kappa=178.33)
f(x) - f* (Loss Difference)
−2.250
−2.255
−2.260
−2.265
−2.270
0
20
40
60
80
100
120
Iterations
Silver Schedule GD
Heavy Ball Method
Nesterov

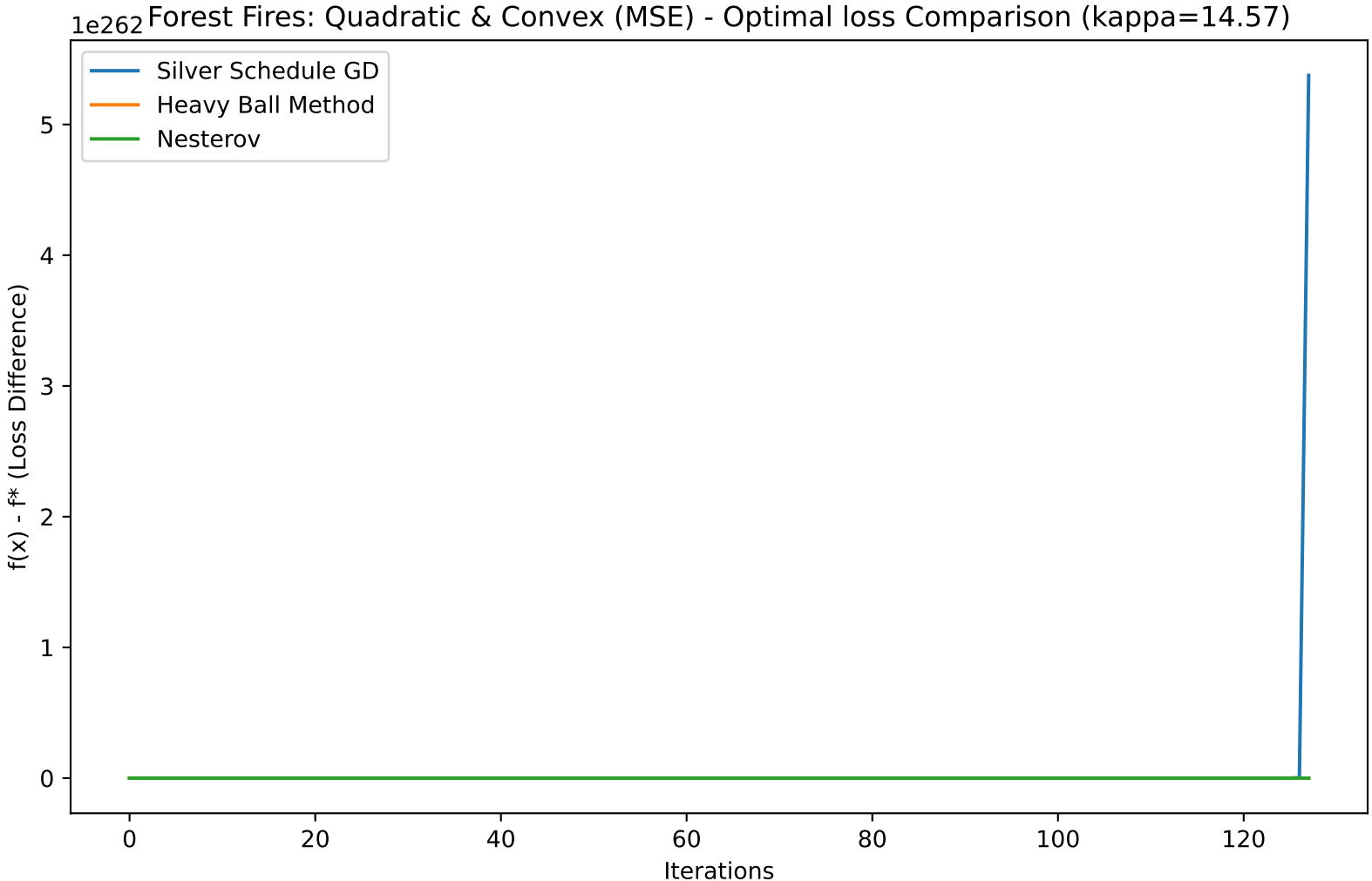

Bike Sharing: Convex, Non-Quadratic (MAE) - Optimal Theta Comparison (kappa=178.33)
x - x* (Theta Difference)
91.0
90.5
90.0
89.5
0
20
40
60
80
100
120
Iterations
Silver Schedule GD
Heavy Ball Method
Nesterov

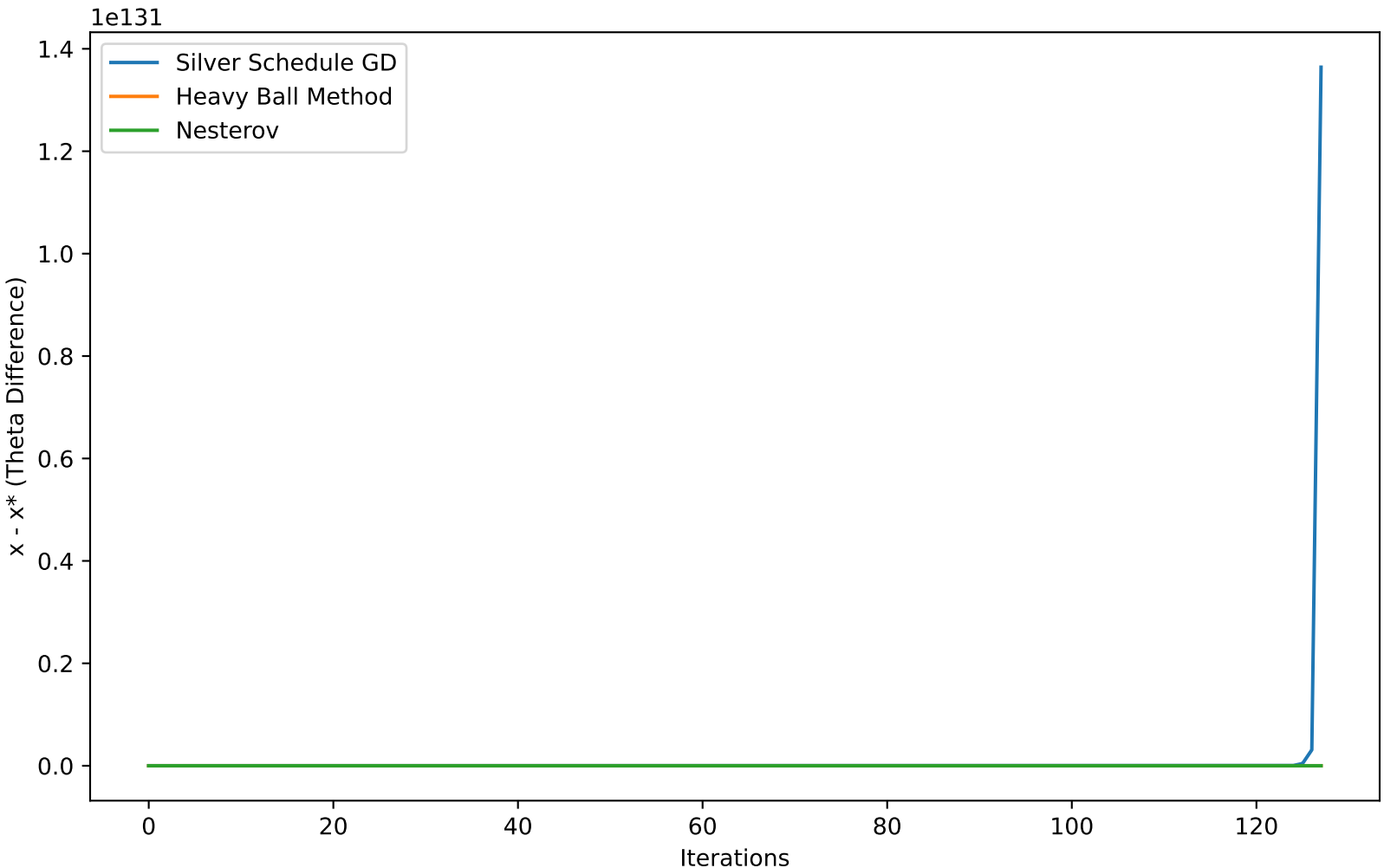

Bike Sharing: Non-Convex (Sinusoidal) - Loss Comparison (kappa=178.33)
1e145
Silver Schedule GD
Heavy Ball Method
Nesterov
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
Loss
0
20
40
60
80
100
120
Iterations

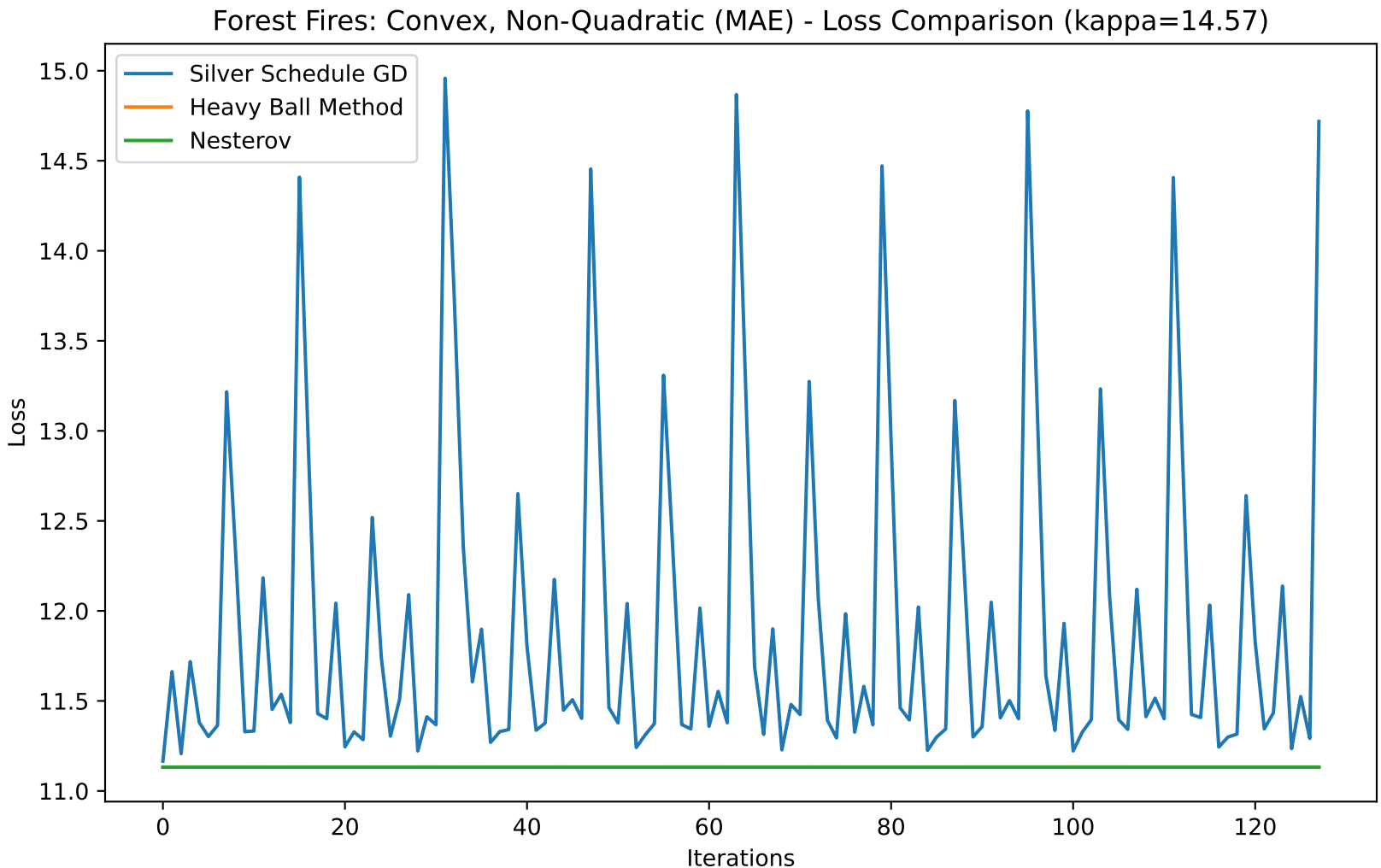

Bike Sharing: Non-Convex (Sinusoidal) - Optimal loss Comparison (kappa=178.33)
1e145
Silver Schedule GD
Heavy Ball Method
Nesterov
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
f(x) - f* (Loss Difference)
0
20
40
60
80
100
120
Iterations

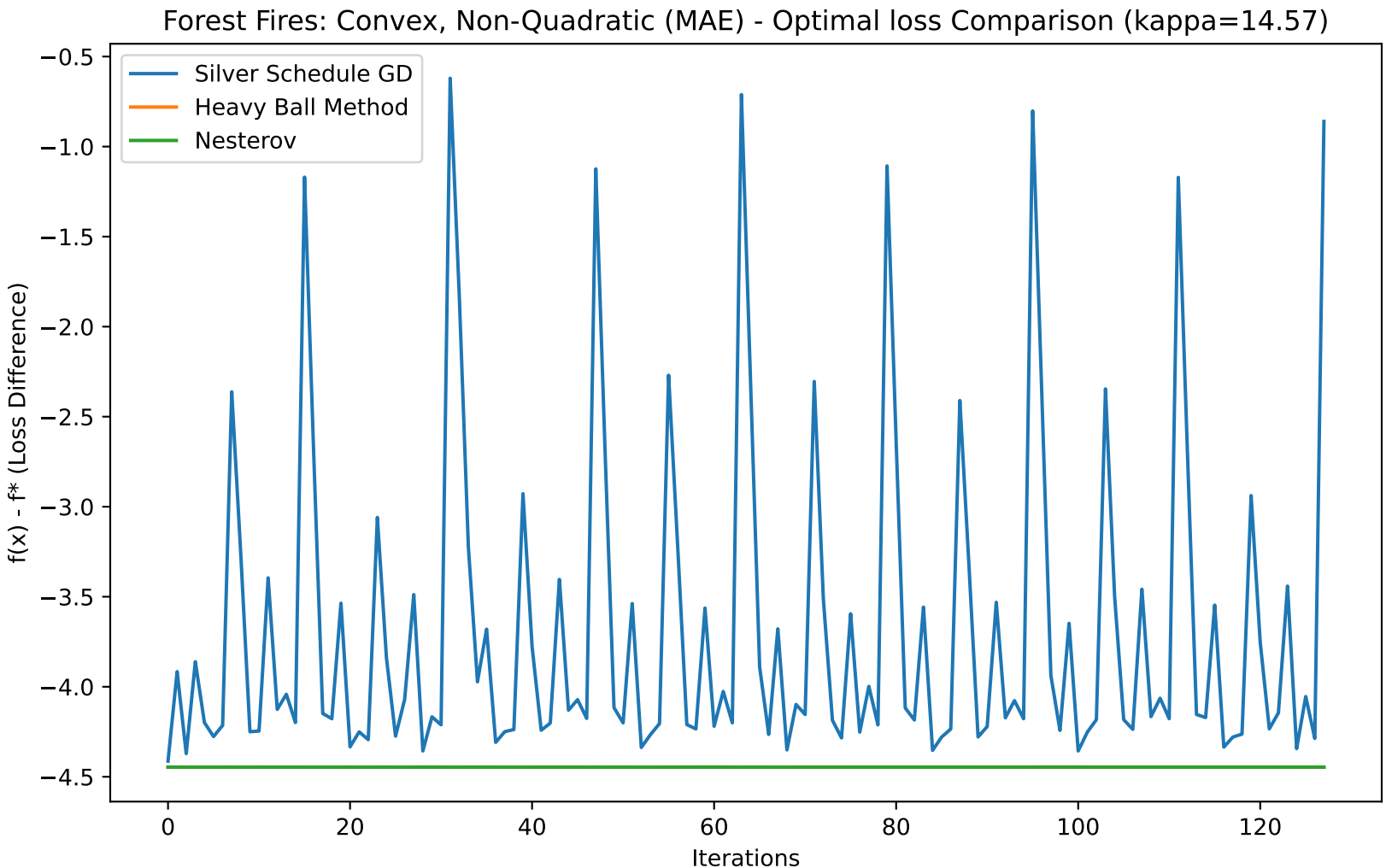

Bike Sharing: Non-Convex (Sinusoidal) - Optimal Theta Comparison (kappa=178.33)
1e72
Silver Schedule GD
Heavy Ball Method
Nesterov
x - x* (Theta Difference)
Iterations
0
1
2
3
4
5
6
0
20
40
60
80
100
120

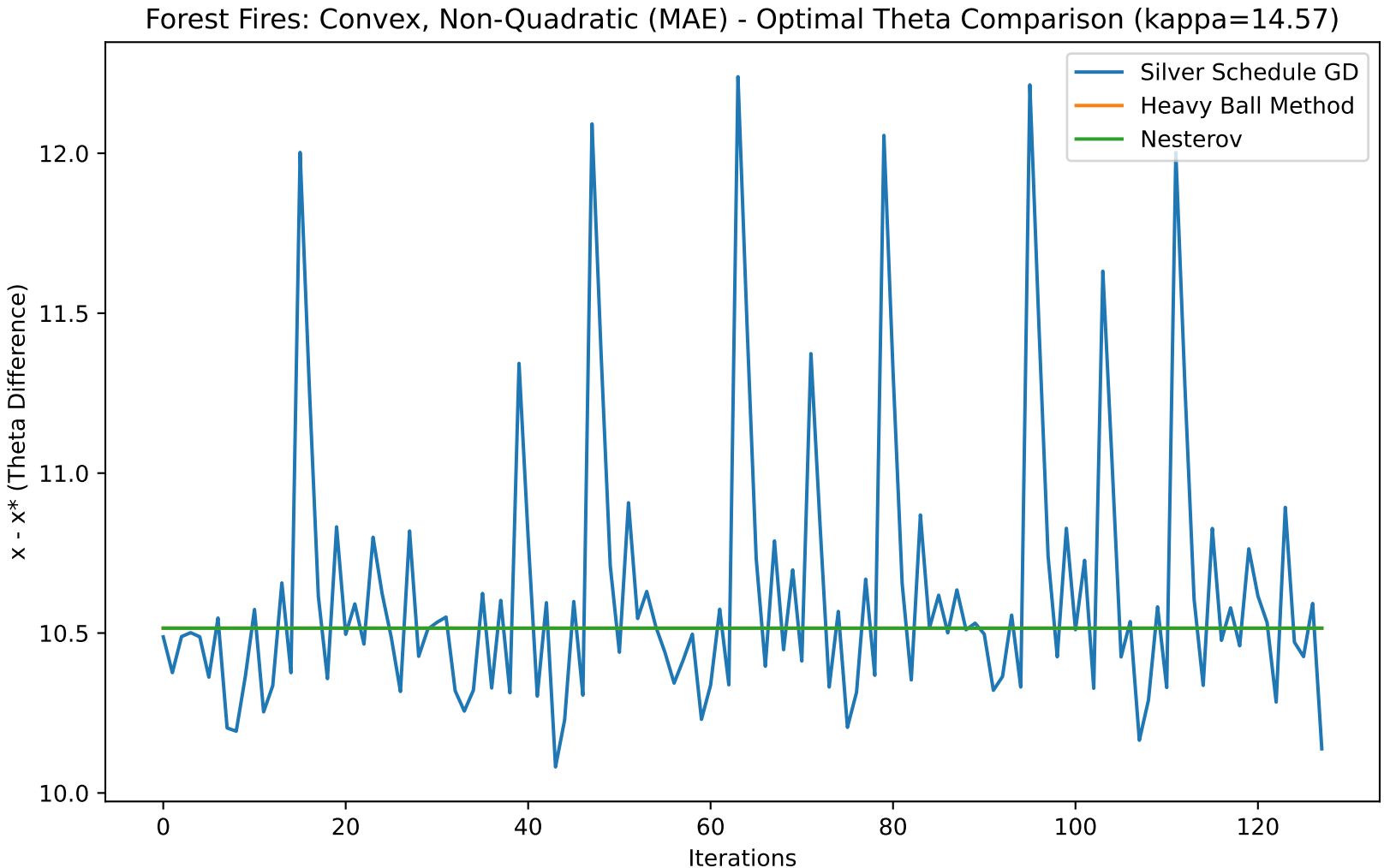

Forest Fires: Quadratic & Convex (MSE) - Loss Comparison (kappa=14.57)
1e262
Silver Schedule GD
Heavy Ball Method
Nesterov
Loss
Iterations
0
1
2
3
4
5
0
20
40
60
80
100
120

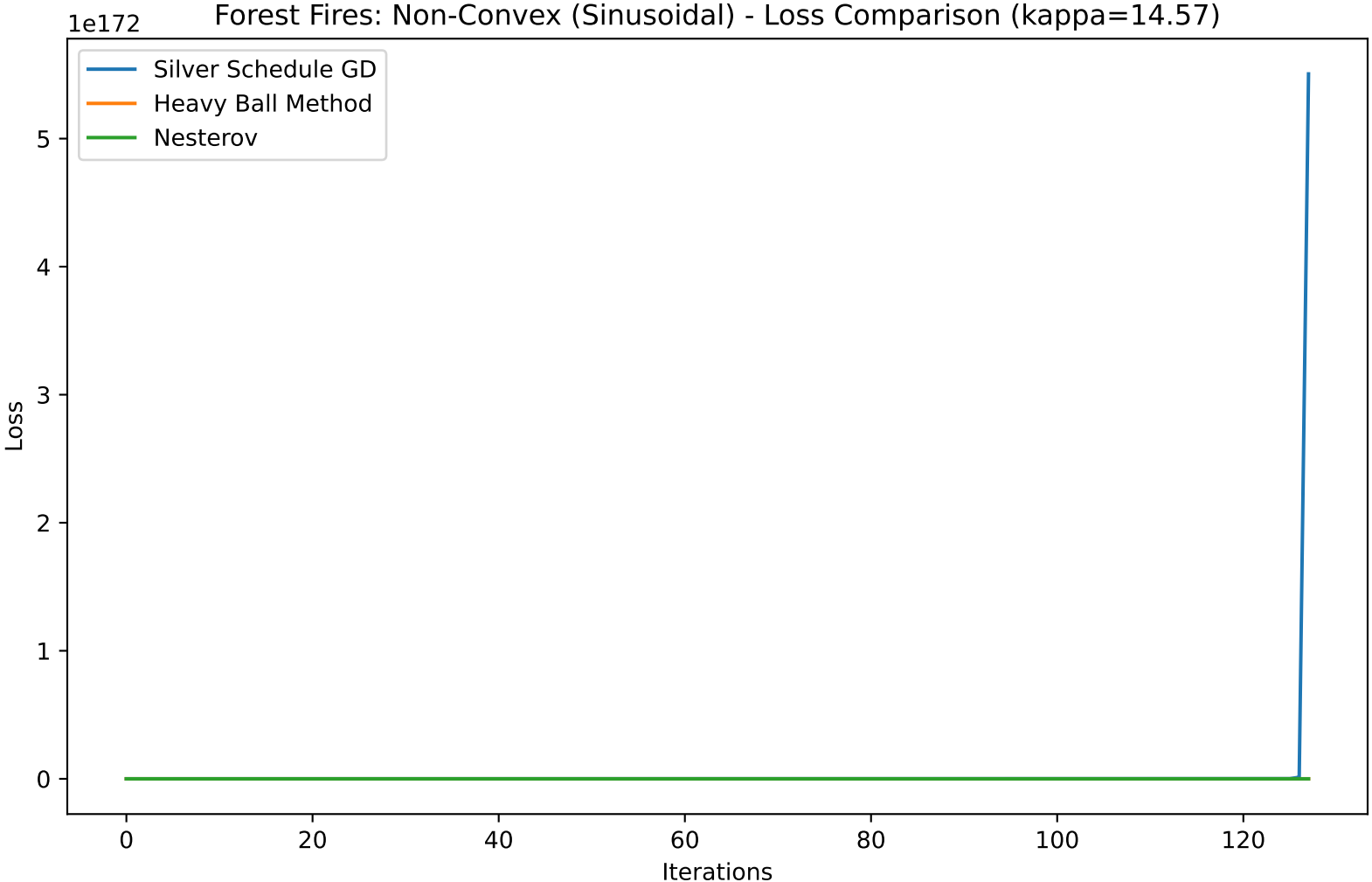

Forest Fires: Quadratic & Convex (MSE) - Optimal loss Comparison (kappa=14.57)
1e262
Silver Schedule GD
Heavy Ball Method
Nesterov
f(x) - f* (Loss Difference)
Iterations
0
1
2
3
4
5
0
20
40
60
80
100
120

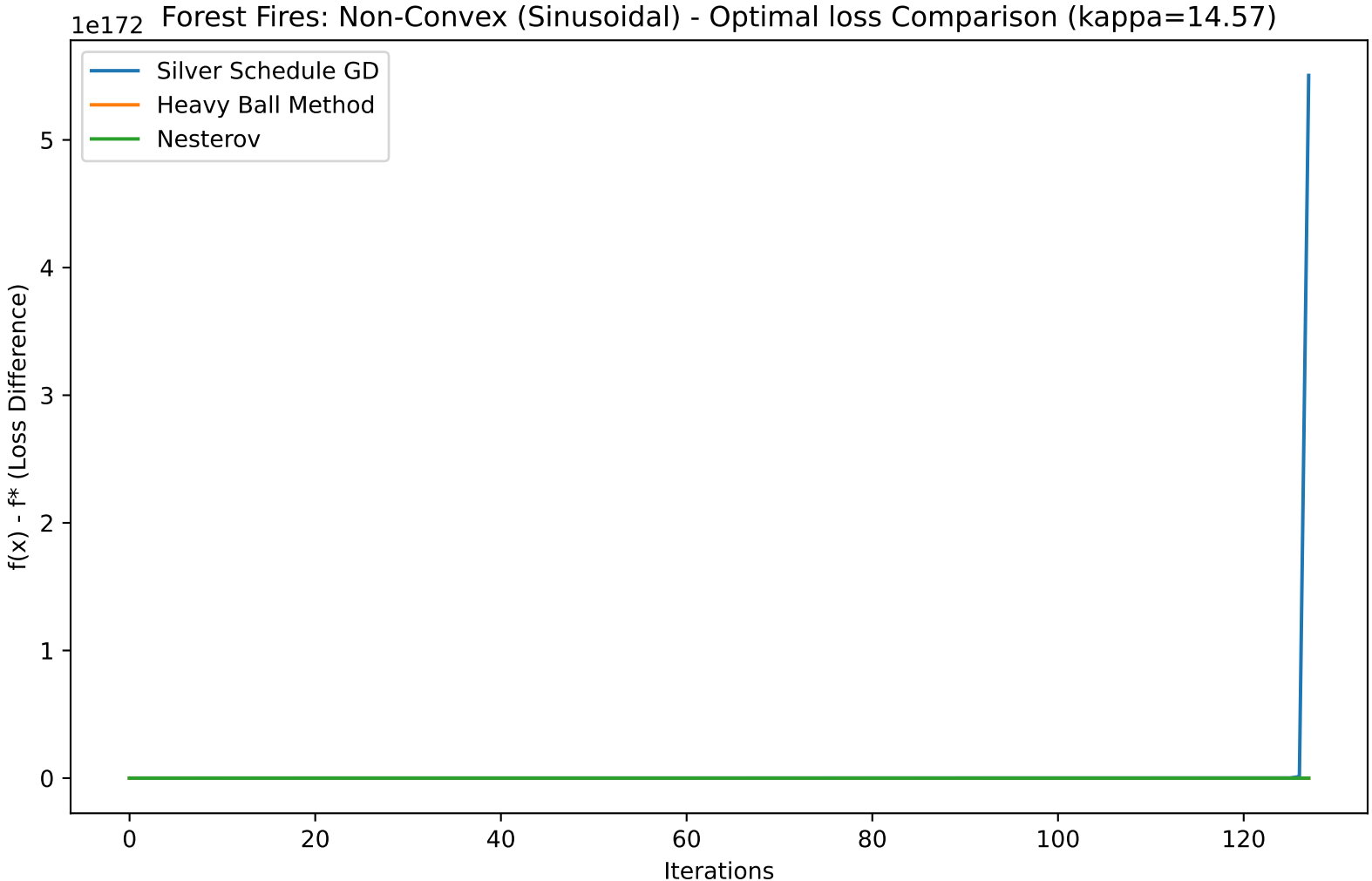

Forest Fires: Quadratic & Convex (MSE) - Optimal Theta Comparison (kappa=14.57)
1e131
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
x - x* (Theta Difference)
Silver Schedule GD
Heavy Ball Method
Nesterov
0
20
40
60
80
100
120
Iterations

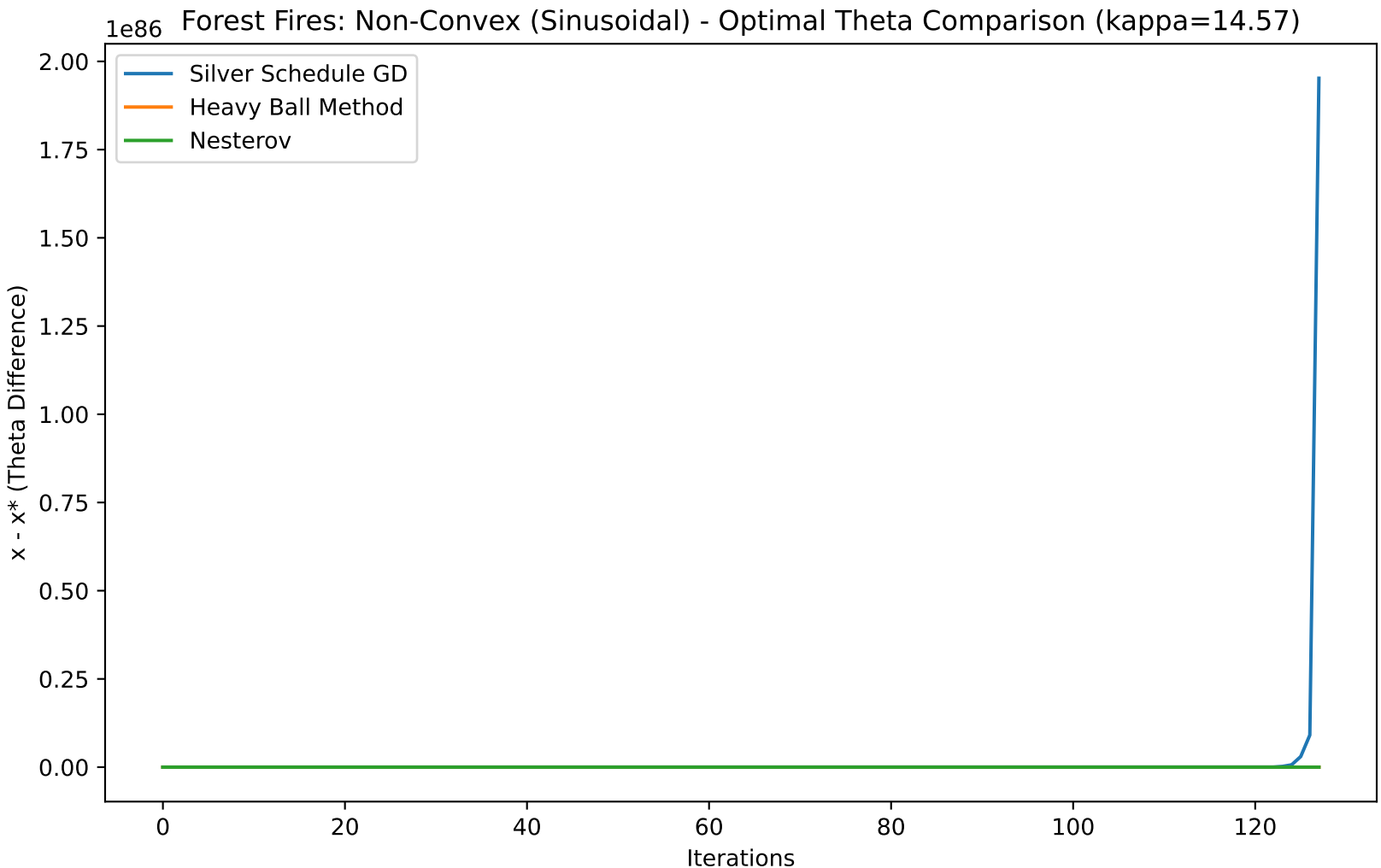

Forest Fires: Convex, Non-Quadratic (MAE) - Loss Comparison (kappa=14.57)
Silver Schedule GD
Heavy Ball Method
Nesterov
Loss
Iterations
15.0
14.5
14.0
13.5
13.0
12.5
12.0
11.5
11.0
0
20
40
60
80
100
120


Forest Fires: Convex, Non-Quadratic (MAE) - Optimal loss Comparison (kappa=14.57)
Silver Schedule GD
Heavy Ball Method
Nesterov
f(x) - f* (Loss Difference)
−0.5
−1.0
−1.5
−2.0
−2.5
−3.0
−3.5
−4.0
−4.5
0
20
40
60
80
100
120
Iterations


Forest Fires: Convex, Non-Quadratic (MAE) - Optimal Theta Comparison (kappa=14.57)
Silver Schedule GD
Heavy Ball Method
Nesterov
x - x* (Theta Difference)
12.0
11.5
11.0
10.5
10.0
0
20
40
60
80
100
120
Iterations


Forest Fires: Non-Convex (Sinusoidal) - Loss Comparison (kappa=14.57)
1e172
Silver Schedule GD
Heavy Ball Method
Nesterov
Loss
Iterations
0
1
2
3
4
5
0
20
40
60
80
100
120


Forest Fires: Non-Convex (Sinusoidal) - Optimal loss Comparison (kappa=14.57)
1e172
Silver Schedule GD
Heavy Ball Method
Nesterov
f(x) - f* (Loss Difference)
Iterations
0
1
2
3
4
5
0
20
40
60
80
100
120


Forest Fires: Non-Convex (Sinusoidal) - Optimal Theta Comparison (kappa=14.57)
1e86
2.00
1.75
1.50
1.25
1.00
0.75
0.50
0.25
0.00
x - x* (Theta Difference)
Silver Schedule GD
Heavy Ball Method
Nesterov
0
20
40
60
80
100
120
Iterations