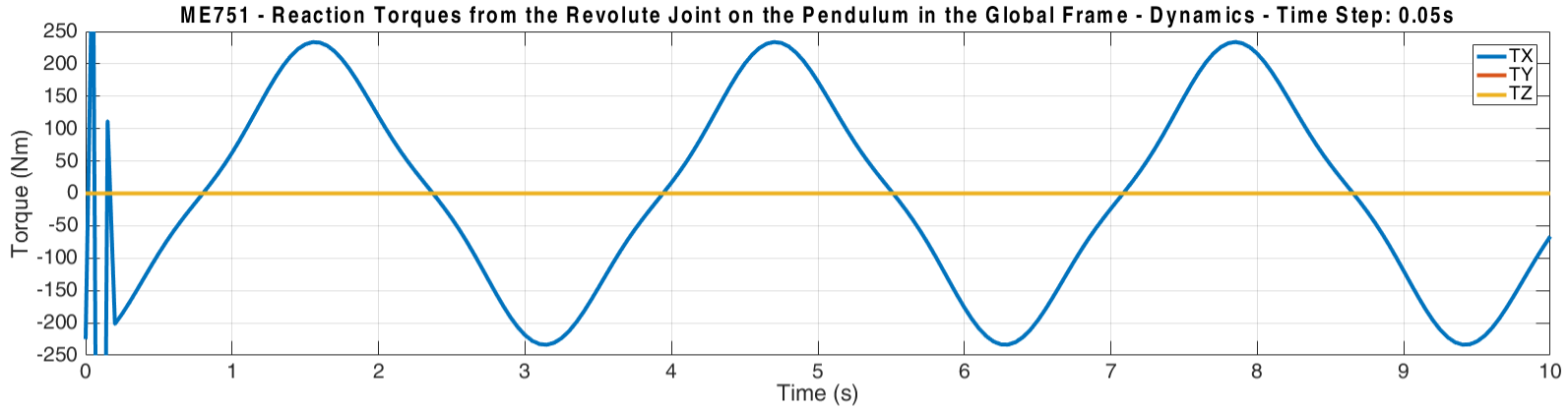
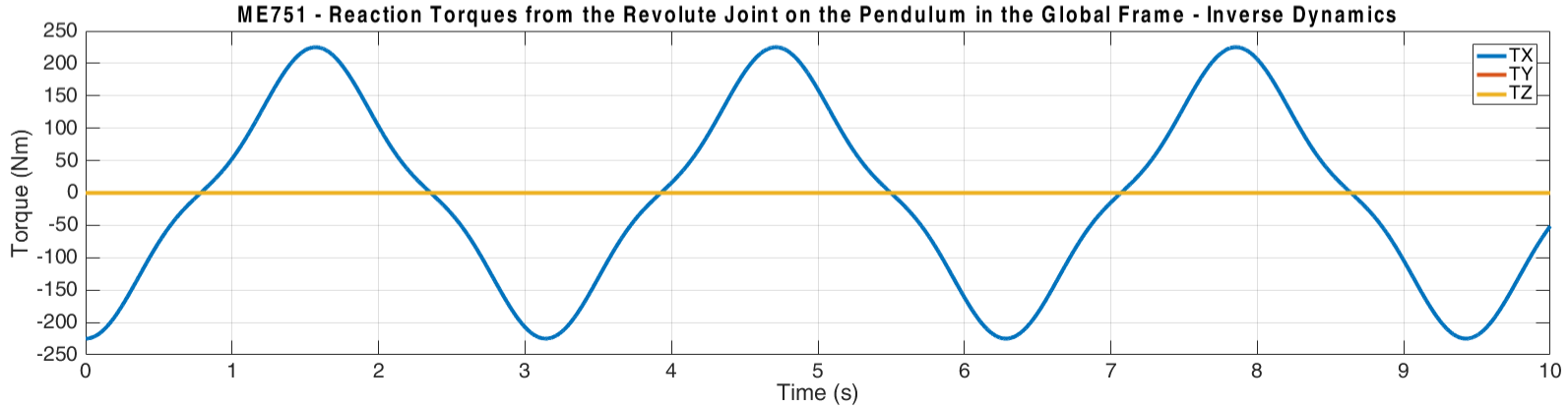
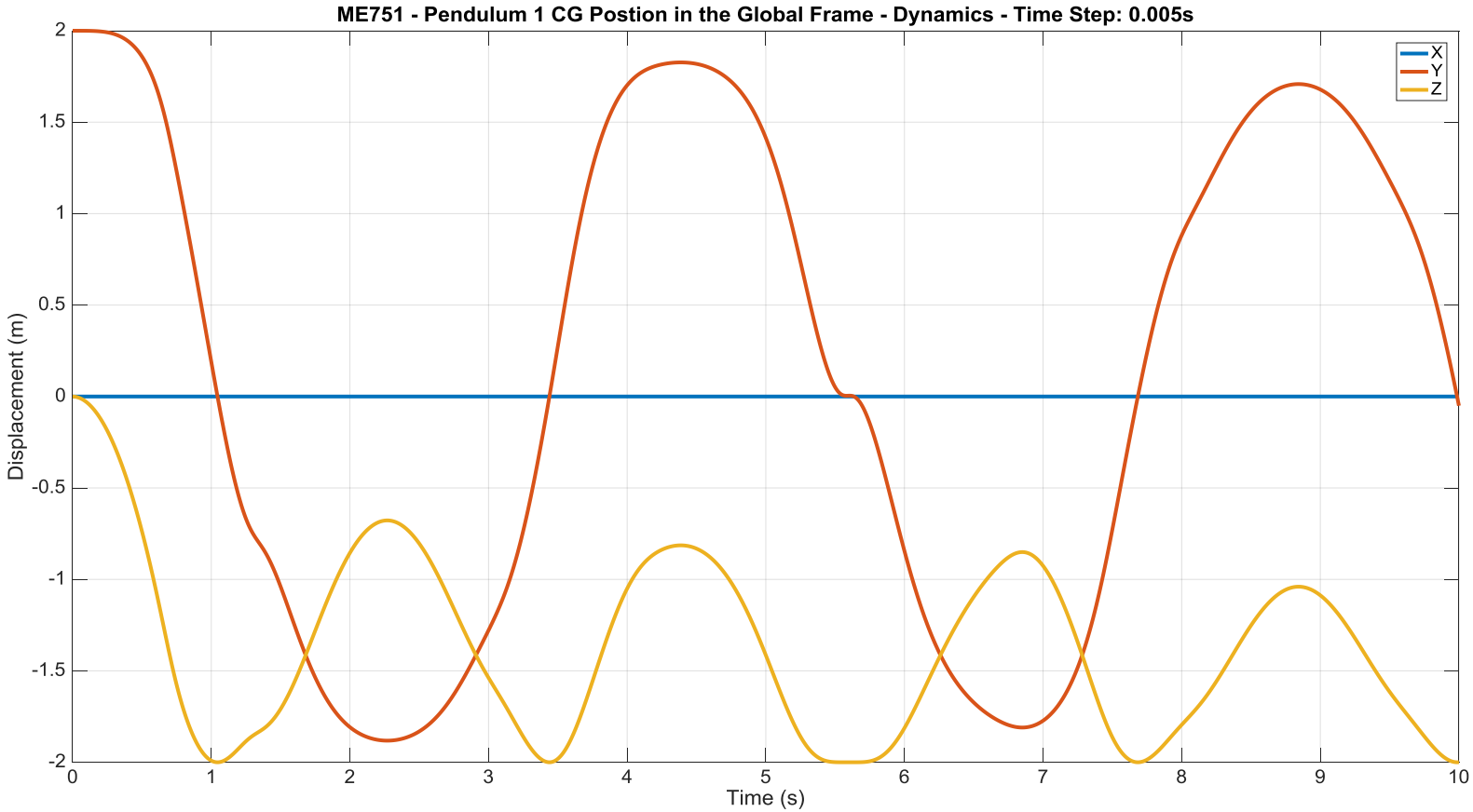
Michael Taylor
ME751 – Homework #8
11/4/2016

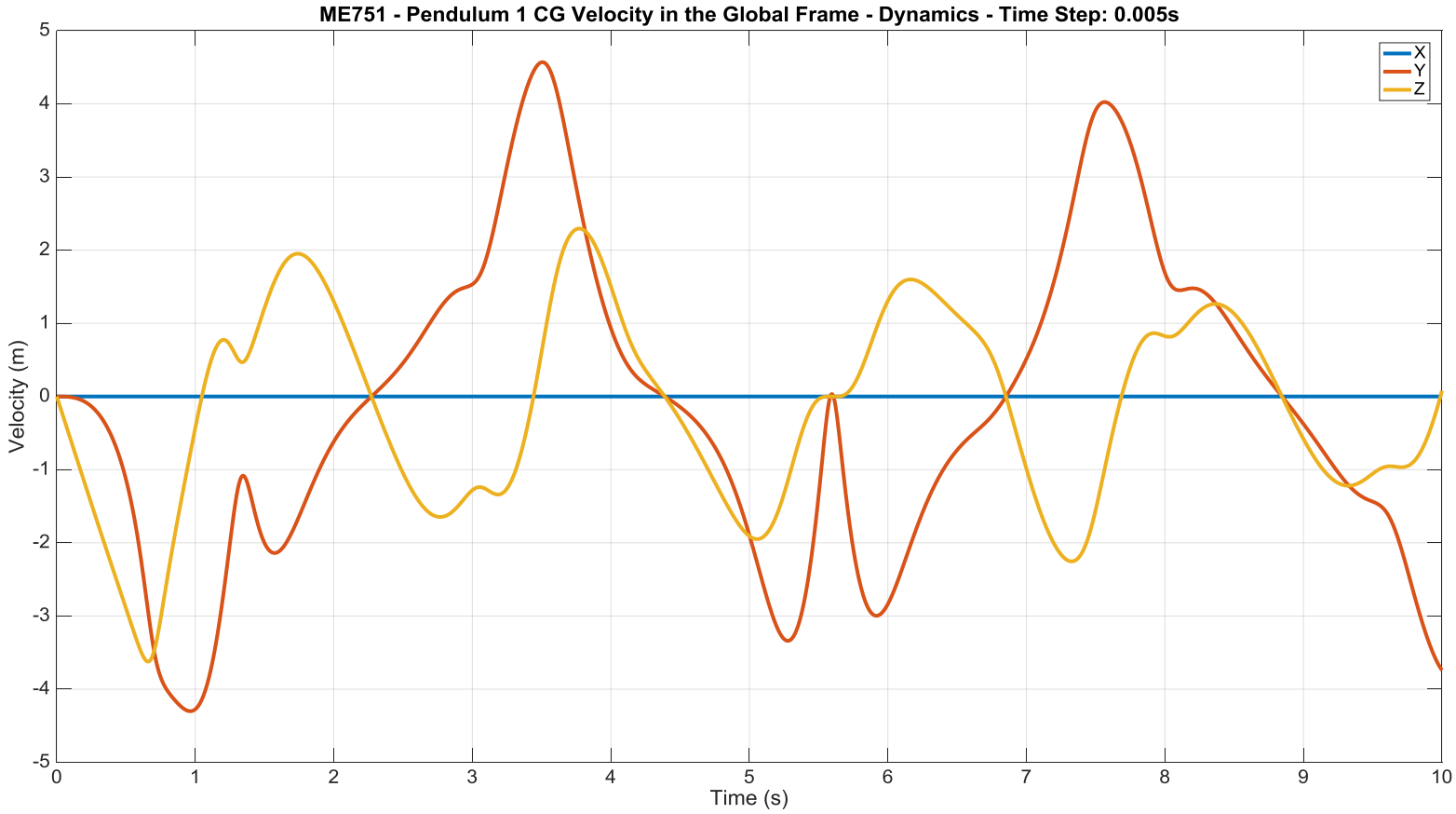
Problem #1

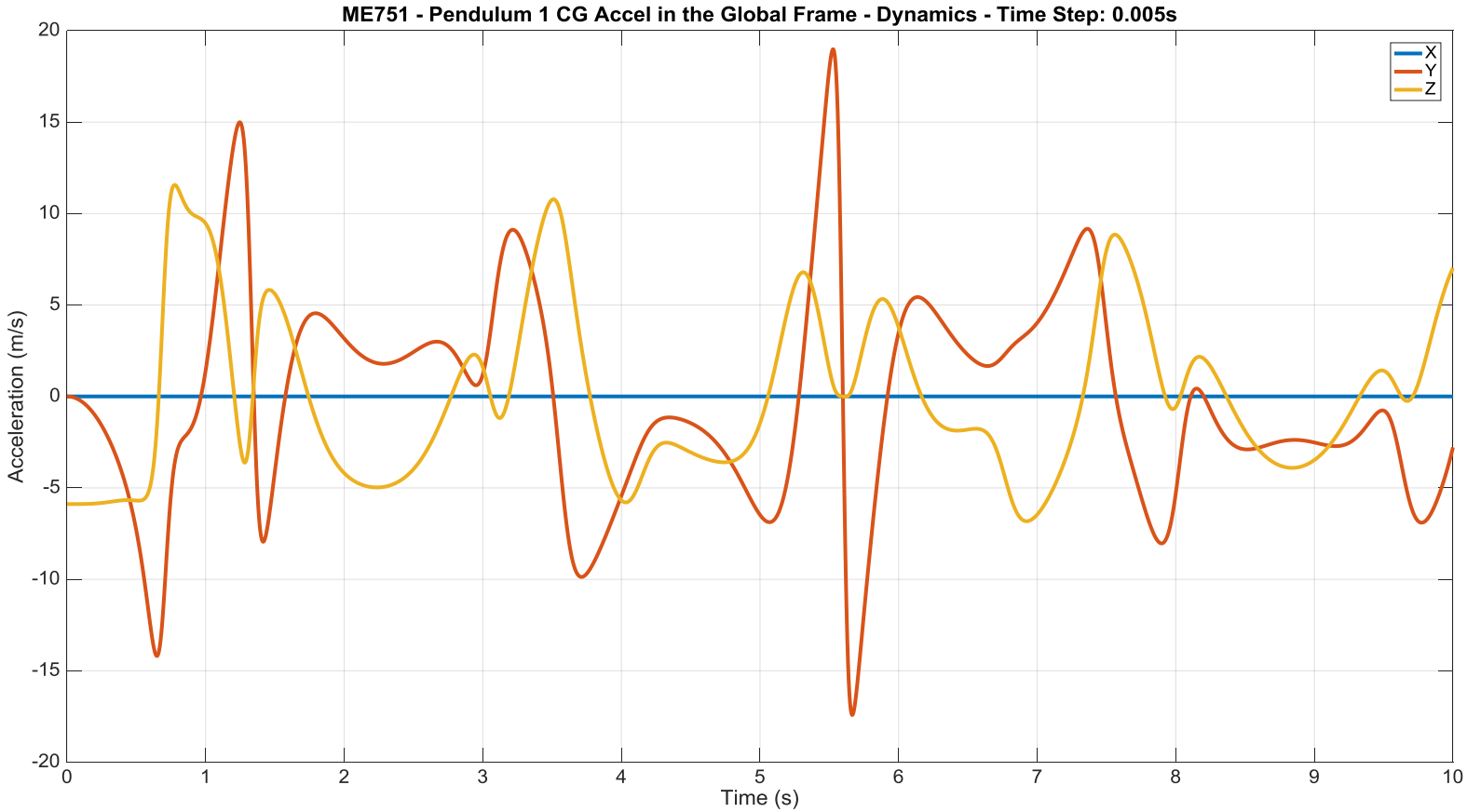


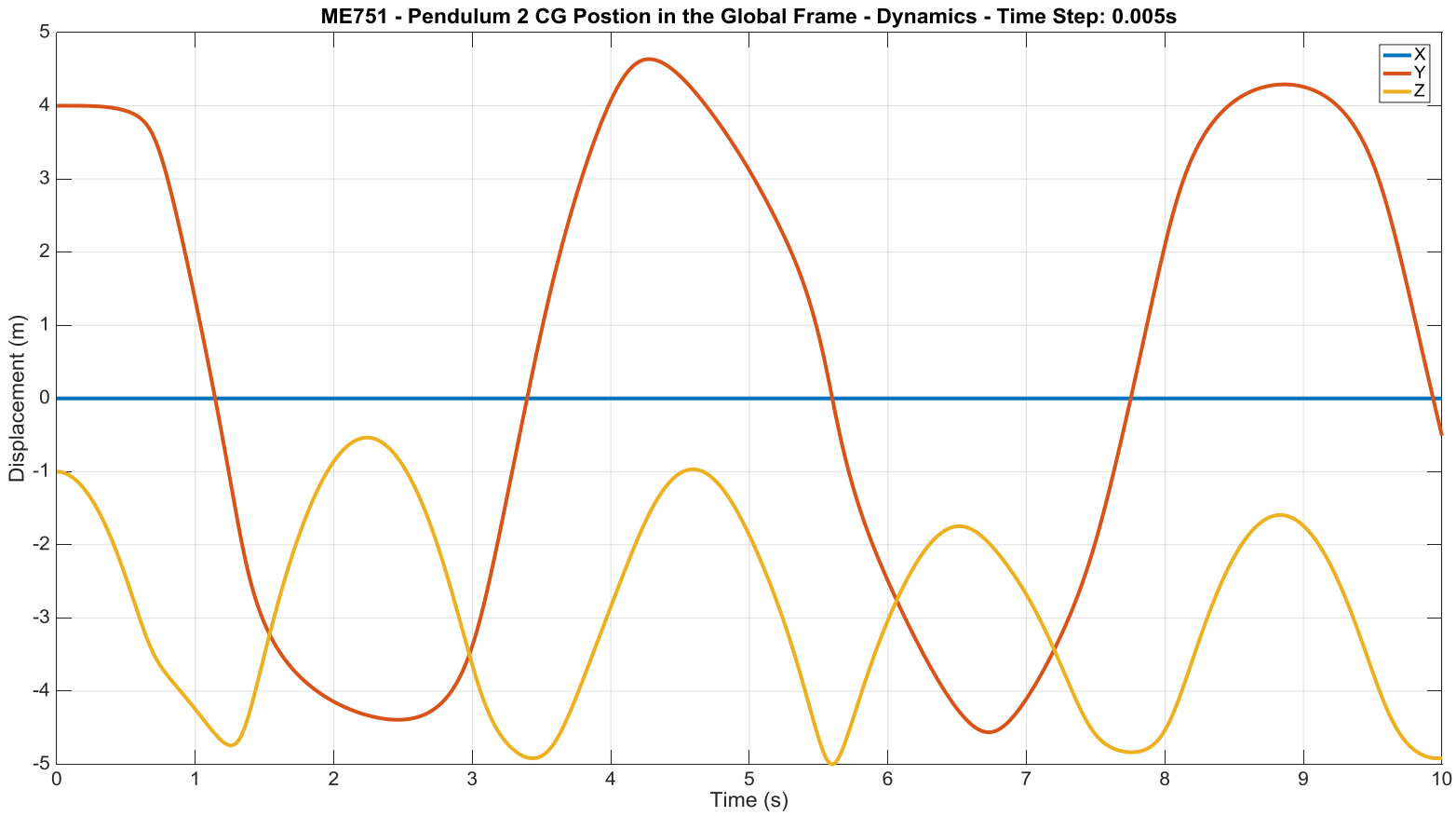


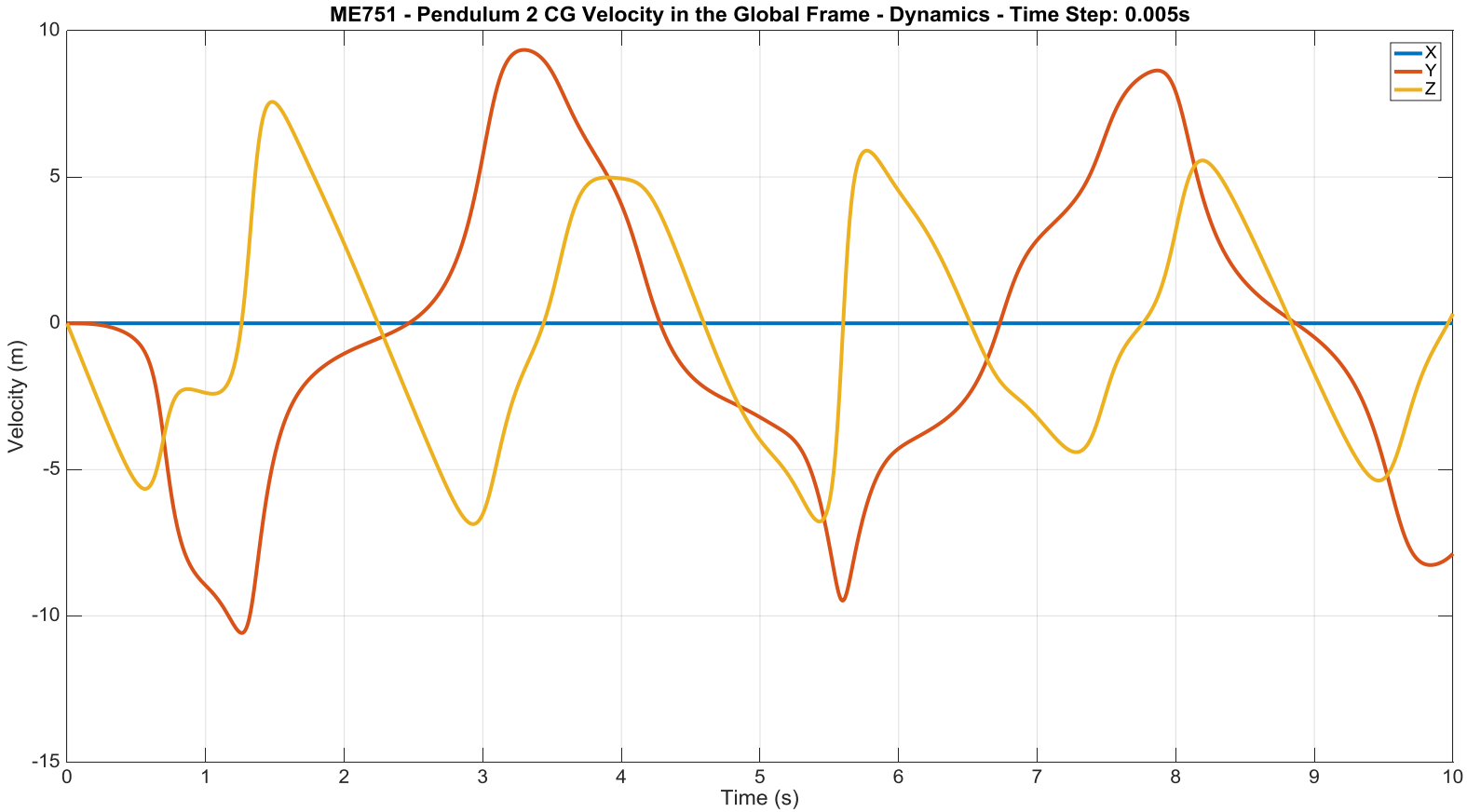
Problem #2

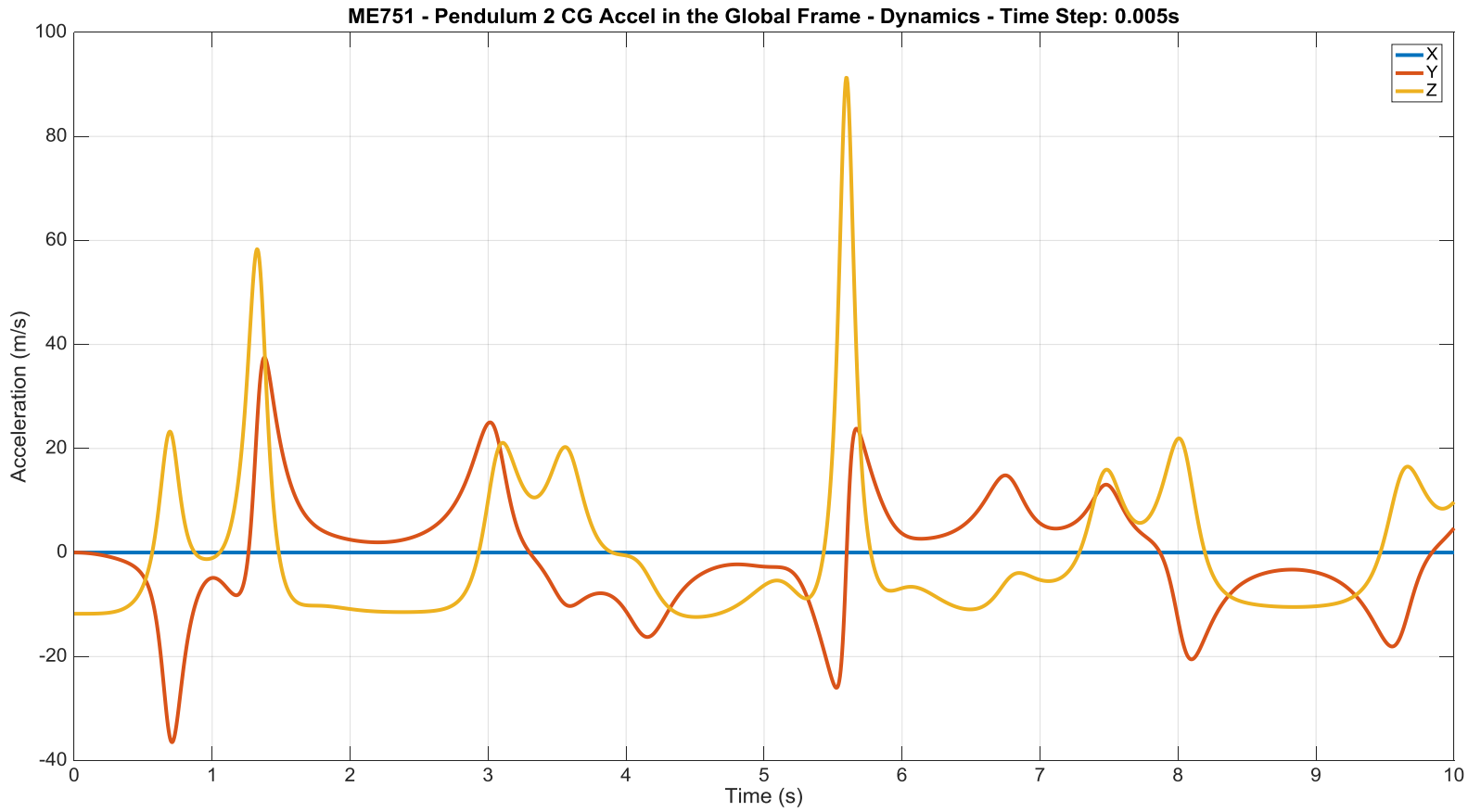

ME751 - Pendulum 1 CG Postion in the Global Frame - Dynamics - Time Step: 0.005s
Displacement (m)
Time (s)
X
Y
Z
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
0
1
2
3
4
5
6
7
8
9
10

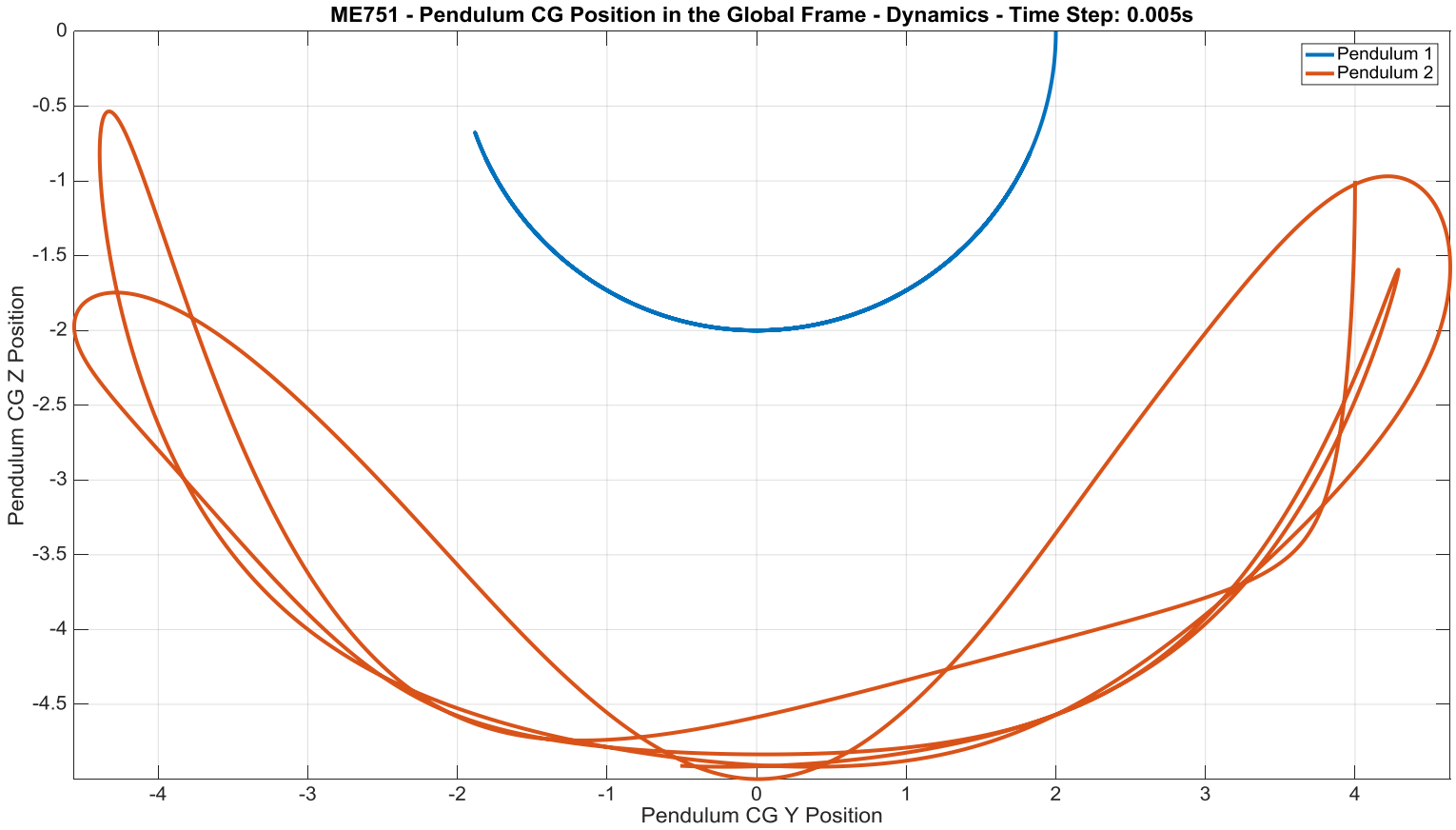

ME751 - Pendulum 1 CG Velocity in the Global Frame - Dynamics - Time Step: 0.005s
X
Y
Z
Velocity (m)
Time (s)
5
4
3
2
1
0
-1
-2
-3
-4
-5
0
1
2
3
4
5
6
7
8
9
10

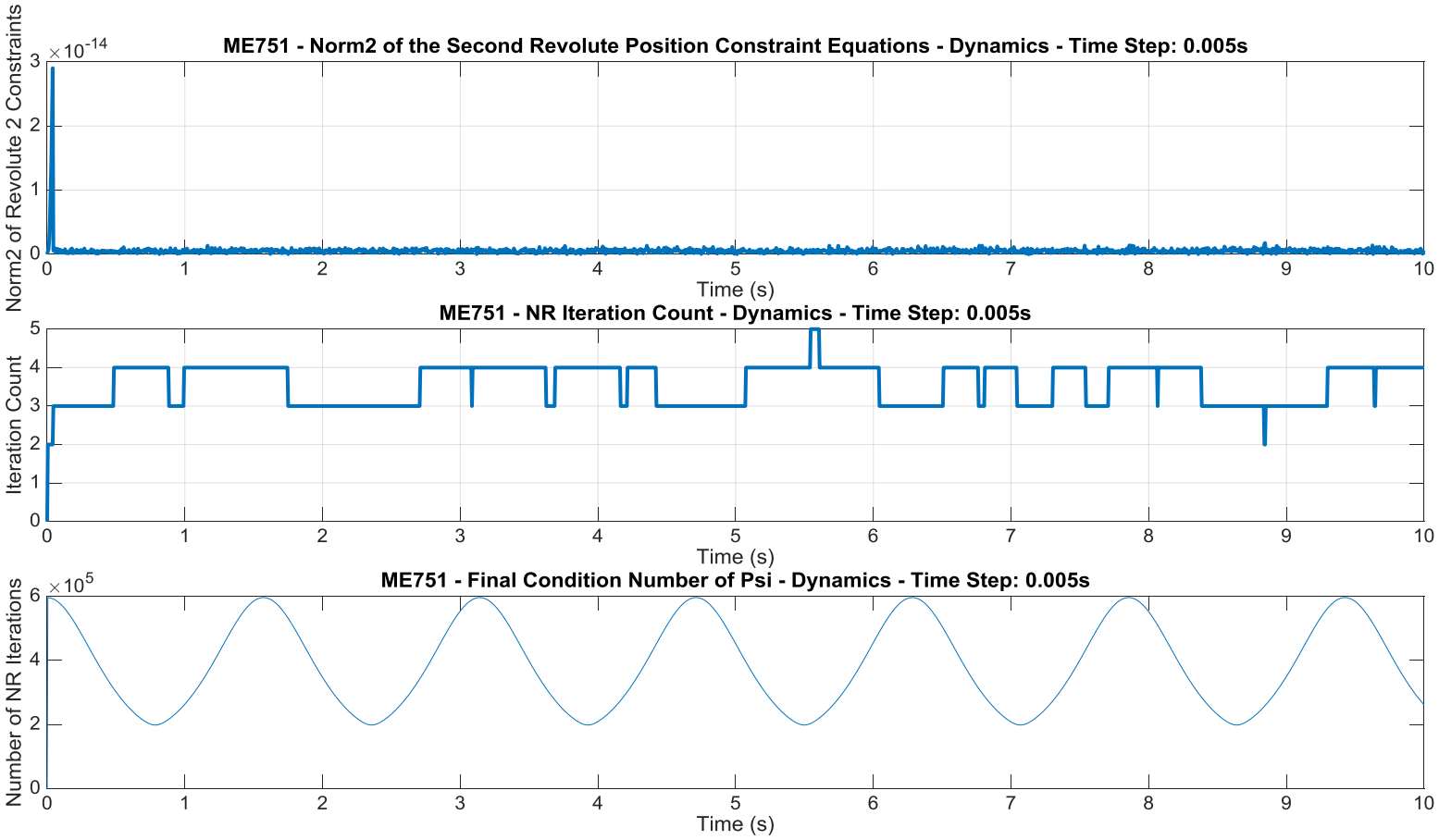

ME751 - Pendulum 1 CG Accel in the Global Frame - Dynamics - Time Step: 0.005s
Acceleration (m/s)
Time (s)
X
Y
Z
20
15
10
5
0
-5
-10
-15
-20
0
1
2
3
4
5
6
7
8
9
10


ME751 - Pendulum 2 CG Postion in the Global Frame - Dynamics - Time Step: 0.005s
X
Y
Z
Displacement (m)
Time (s)
5
4
3
2
1
0
-1
-2
-3
-4
-5
0
1
2
3
4
5
6
7
8
9
10

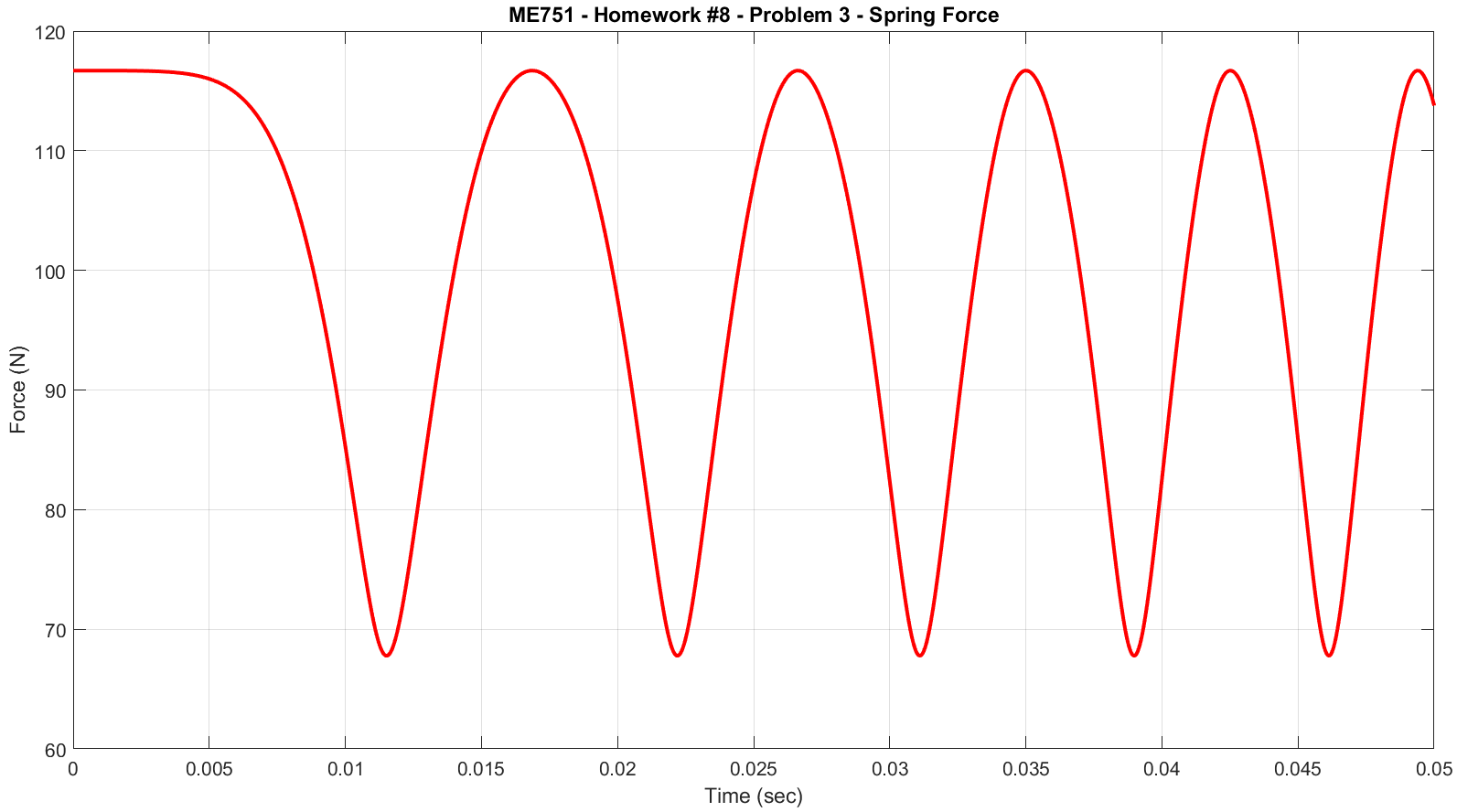

ME751 - Pendulum 2 CG Velocity in the Global Frame - Dynamics - Time Step: 0.005s
Velocity (m)
Time (s)
X
Y
Z
10
5
0
-5
-10
-15
0
1
2
3
4
5
6
7
8
9
10

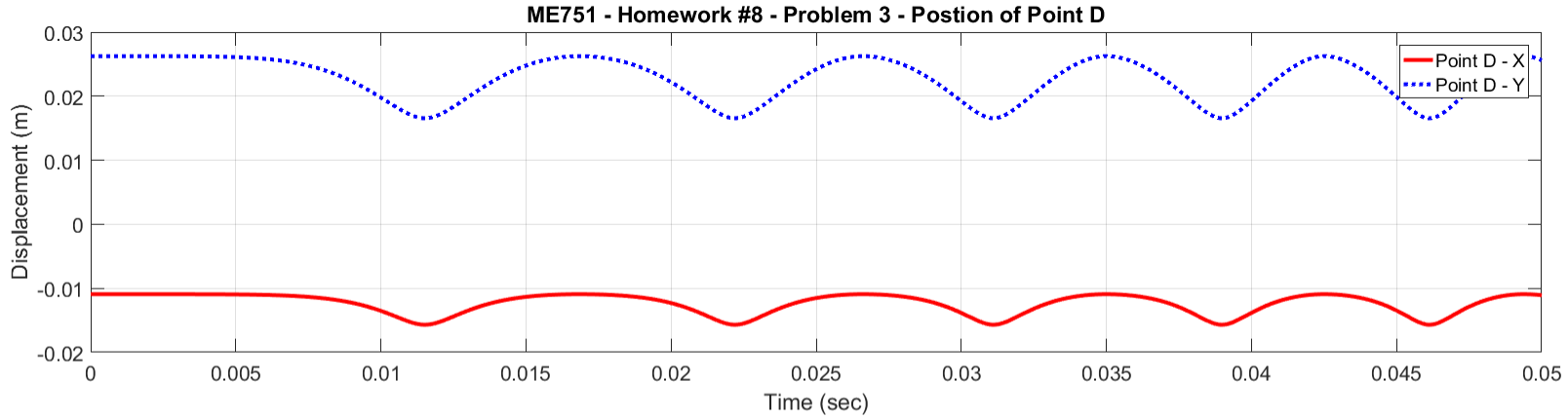

ME751 - Pendulum 2 CG Accel in the Global Frame - Dynamics - Time Step: 0.005s
Acceleration (m/s)
Time (s)
X
Y
Z
100
80
60
40
20
0
-20
-40
0
1
2
3
4
5
6
7
8
9
10

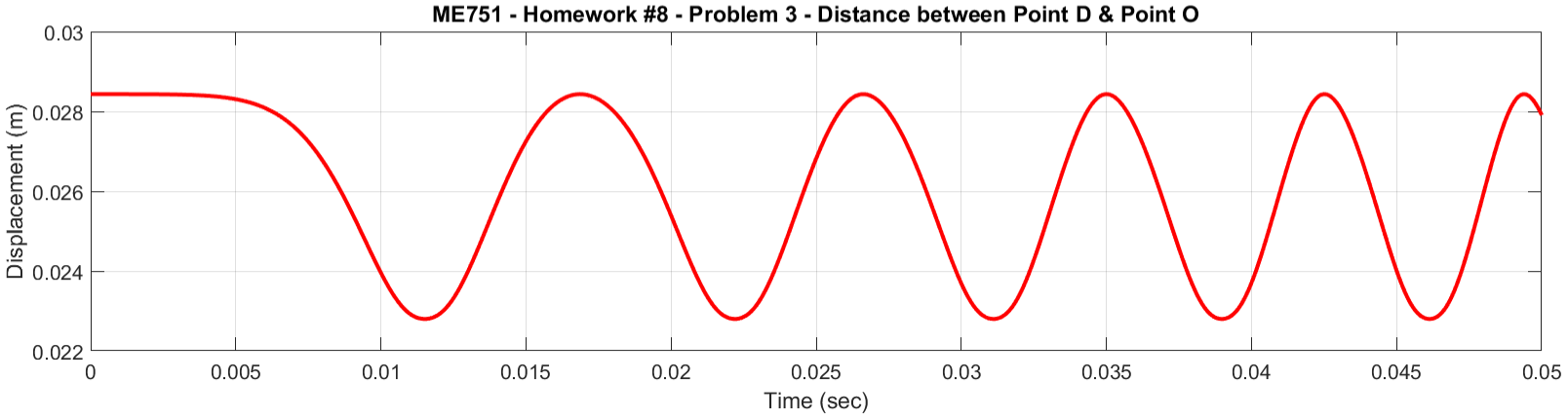

ME751 - Pendulum CG Position in the Global Frame - Dynamics - Time Step: 0.005s
Pendulum 1
Pendulum 2
Pendulum CG Z Position
Pendulum CG Y Position
0
-0.5
-1
-1.5
-2
-2.5
-3
-3.5
-4
-4.5
-4
-3
-2
-1
0
1
2
3
4

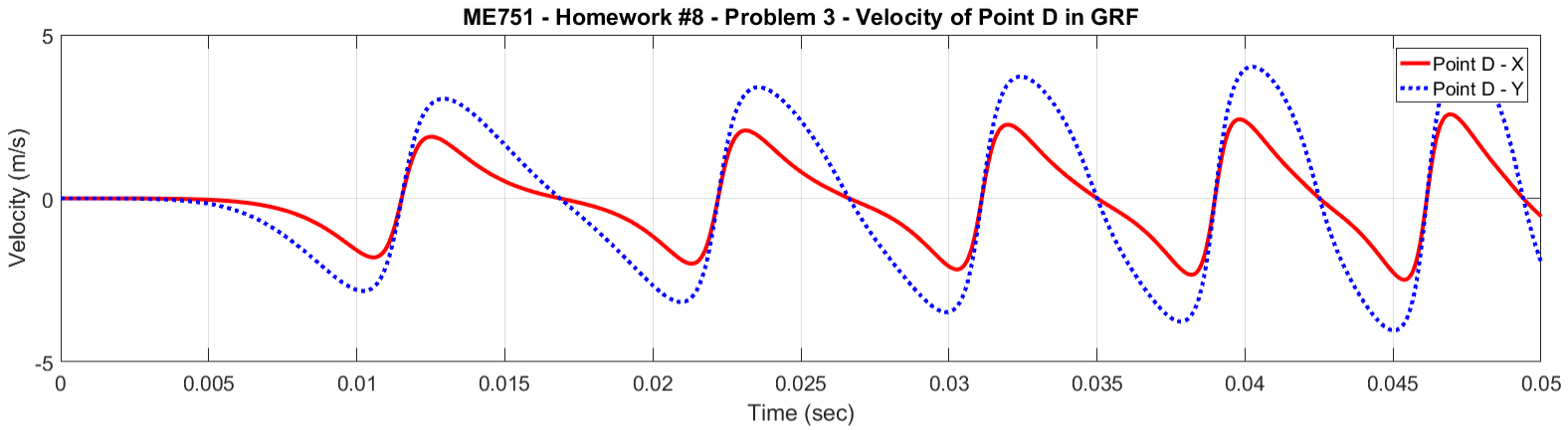

ME751 - Norm2 of the Second Revolute Position Constraint Equations - Dynamics - Time Step: 0.005s
Norm2 of Revolute 2 Constraints
×10^-14
Time (s)
ME751 - NR Iteration Count - Dynamics - Time Step: 0.005s
Iteration Count
Time (s)
ME751 - Final Condition Number of Psi - Dynamics - Time Step: 0.005s
Number of NR Iterations
×10^5
Time (s)

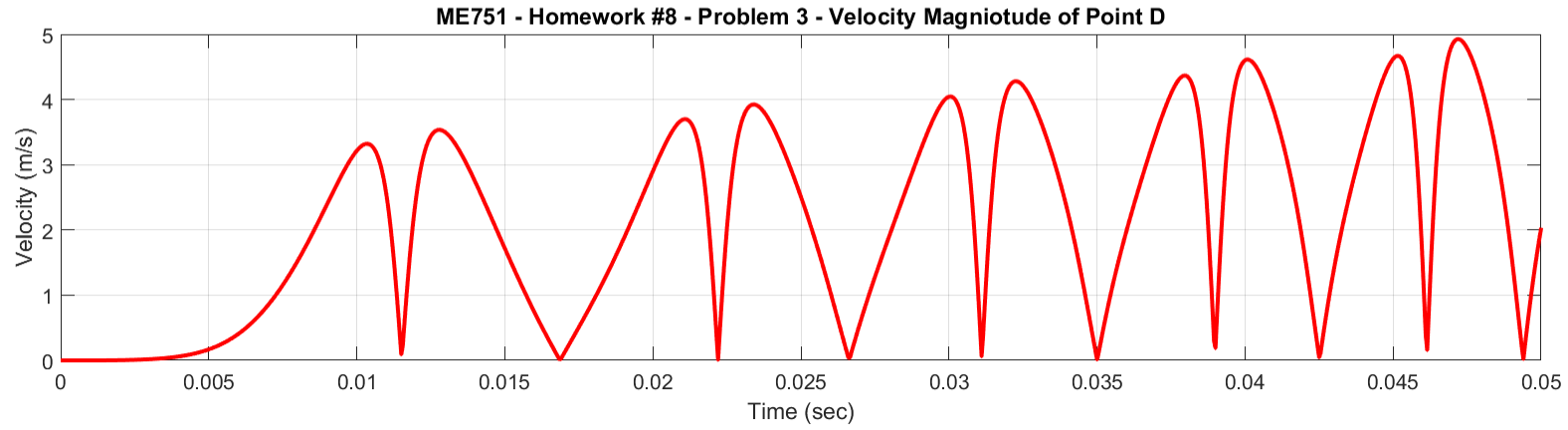
Problem #3


ME751 - Homework #8 - Problem 3 - Spring Force
Force (N)
Time (sec)
120
110
100
90
80
70
60
0
0.005
0.01
0.015
0.02
0.025
0.03
0.035
0.04
0.045
0.05


ME751 - Homework #8 - Problem 3 - Postion of Point D
Point D - X
Point D - Y
Displacement (m)
Time (sec)
0.03
0.02
0.01
0
-0.01
-0.02
0
0.005
0.01
0.015
0.02
0.025
0.03
0.035
0.04
0.045
0.05


ME751 - Homework #8 - Problem 3 - Distance between Point D & Point O
Displacement (m)
Time (sec)
0.03
0.028
0.026
0.024
0.022
0
0.005
0.01
0.015
0.02
0.025
0.03
0.035
0.04
0.045
0.05


ME751 - Homework #8 - Problem 3 - Velocity of Point D in GRF
Point D - X
Point D - Y
Velocity (m/s)
Time (sec)
5
0
-5
0
0.005
0.01
0.015
0.02
0.025
0.03
0.035
0.04
0.045
0.05


ME751 - Homework #8 - Problem 3 - Velocity Magniotude of Point D
Velocity (m/s)
Time (sec)
5
4
3
2
1
0
0
0.005
0.01
0.015
0.02
0.025
0.03
0.035
0.04
0.045
0.05