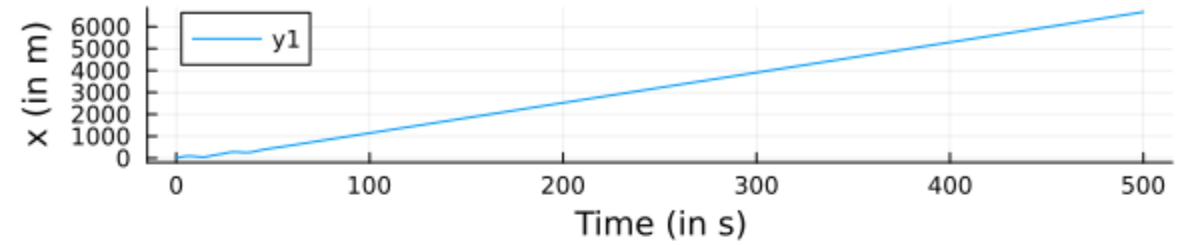
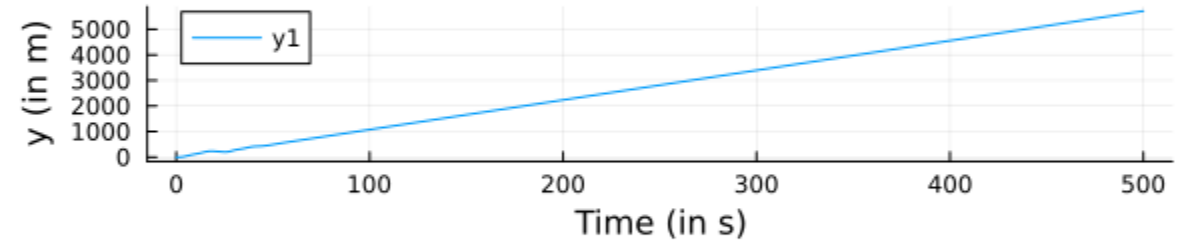
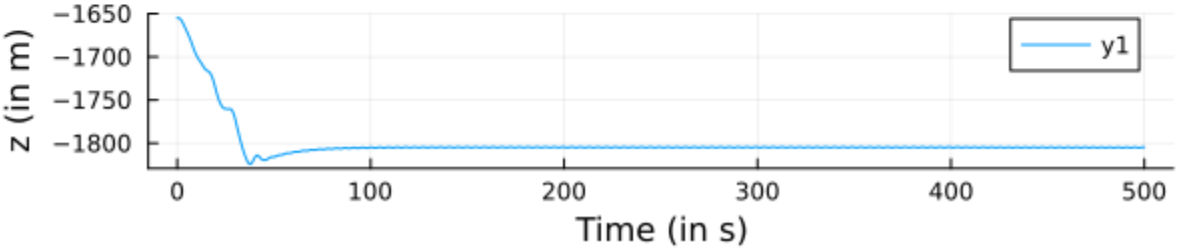
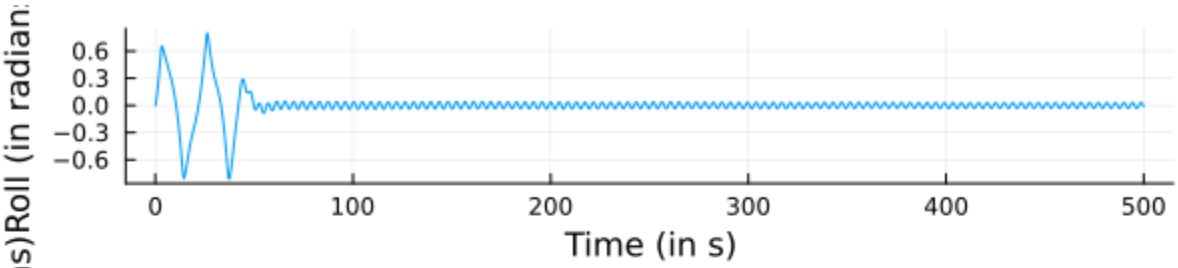
```julia
#Problem 1

function FlightPathAnglesFromState(aircraft_state)

    euler_angles = EulerAngles(aircraft_state[4:6])
    wind_angles = AirRelativeVelocityVectorToWindAngles(aircraft_state[7:9])
    Vg = TransformFromBodyToInertial(aircraft_state[7:9], euler_angles)
    #=
    We know γ_a = γ when there is no wind.
    Thus, γ = γ_a = θ - α
    =#
    # γ = aircraft_state.θ - wind_angles.α
    γ = atan(Vg[3], sqrt(Vg[1]^2 + Vg[2]^2))
    χ = atan(Vg[2], Vg[1])

    return (Vg,χ,γ)
end


#=
filename = "ttwistor.mat"
aircraft_parameters = AircraftParameters(filename)

trim_definition = TrimDefinitionCT(18.0,0.0,1655,500.0)
state, control, results = GetTrimConditions(trim_definition, aircraft_parameters)
trim_variables = TrimVariablesCT(results.minimizer)
Vg, χ, γ = FlightPathAnglesFromState(state)
=#
```

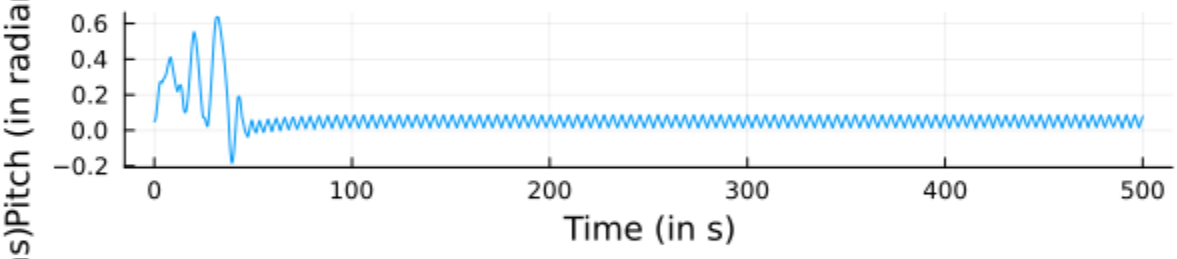
Problem 4

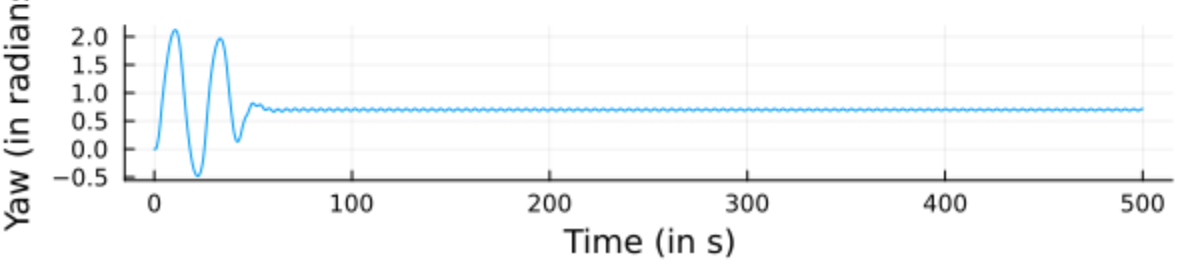

x (in m)
6000
5000
4000
3000
2000
1000
0
y1
0
100
200
300
400
500
Time (in s)

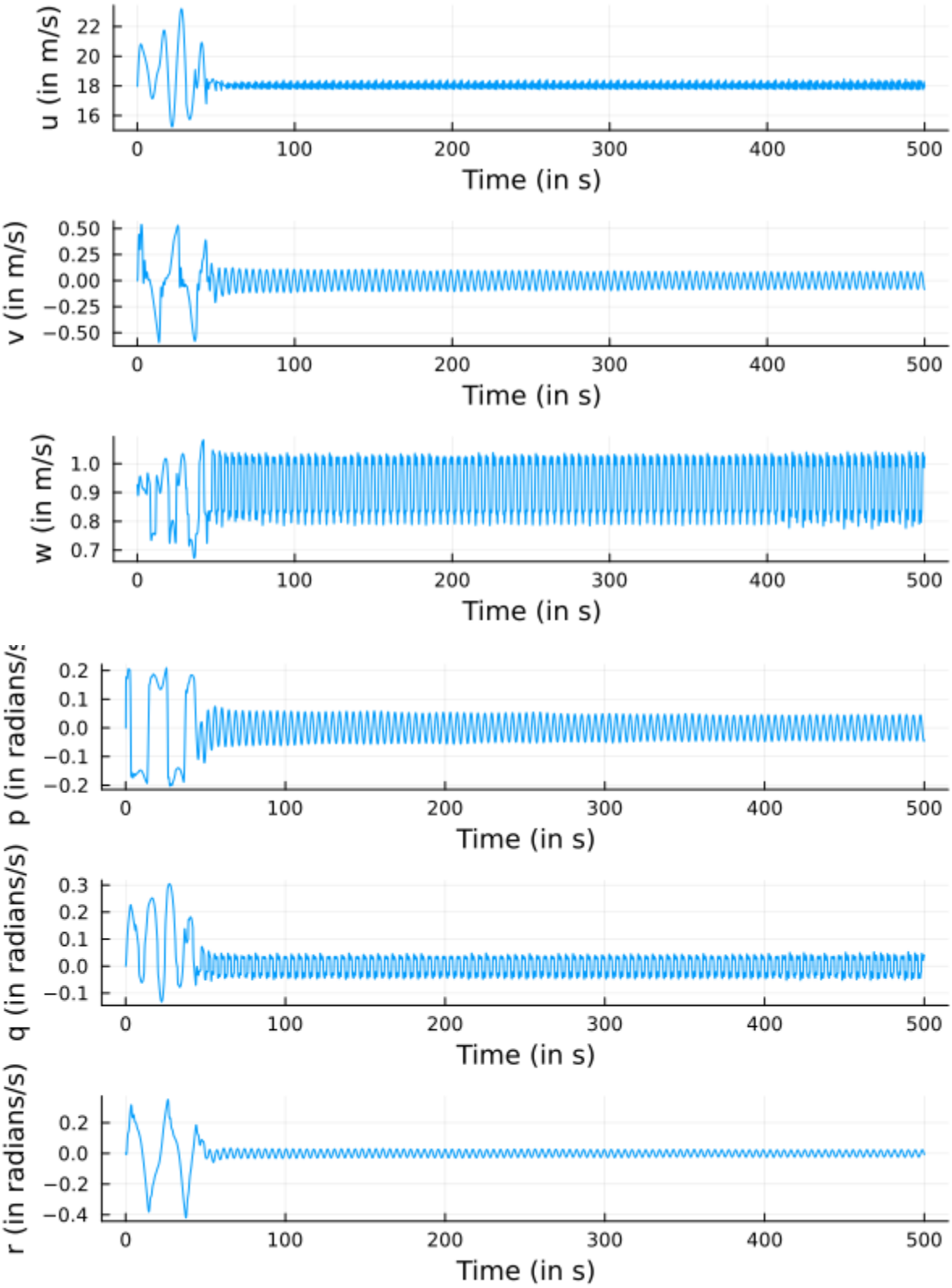

y (in m)
5000
4000
3000
2000
1000
0
y1
0
100
200
300
400
500
Time (in s)

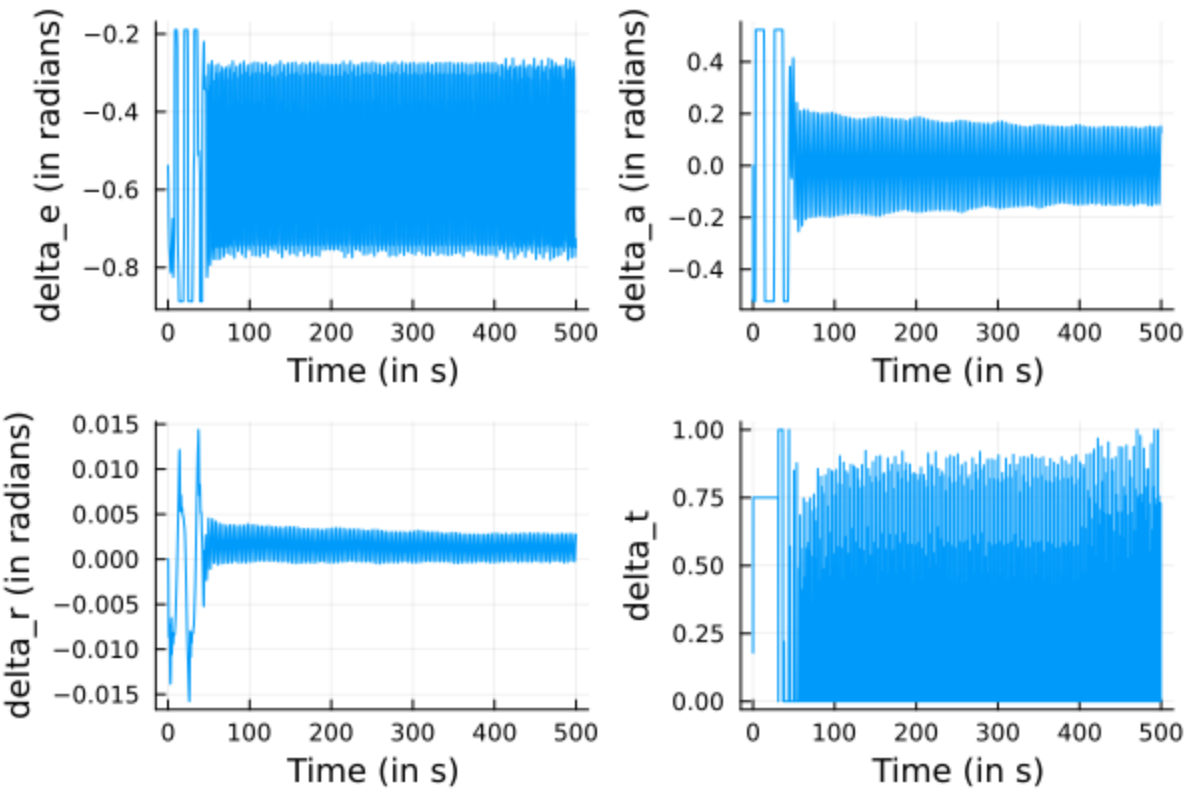

z (in m)
−1650
−1700
−1750
−1800
y1
0
100
200
300
400
500
Time (in s)

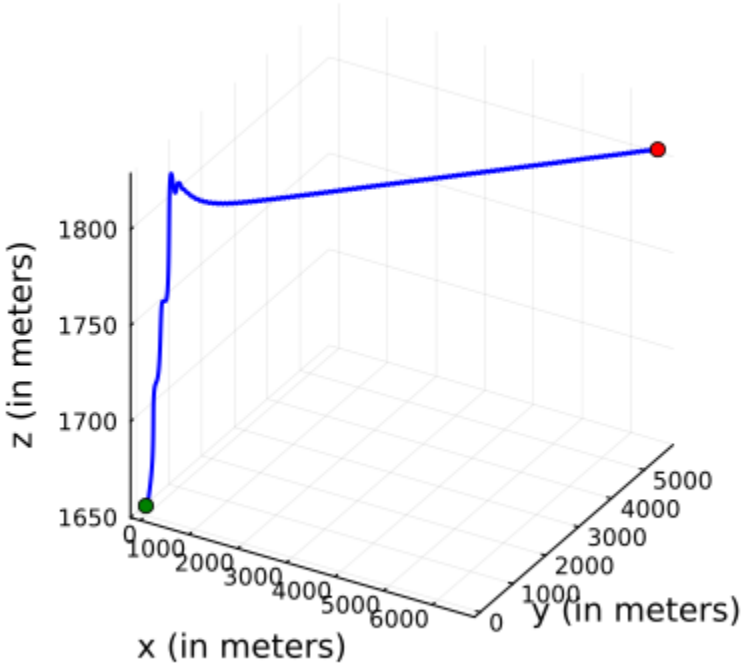

Roll (in radian
0.6
0.3
0.0
−0.3
−0.6
0
100
200
300
400
500
Time (in s)


Pitch (in radians)
0.6
0.4
0.2
0.0
−0.2
0
100
200
300
400
500
Time (in s)


Yaw (in radians)
2.0
1.5
1.0
0.5
0.0
−0.5
0
100
200
300
400
500
Time (in s)


u (in m/s)
22
20
18
16
0
100
200
300
400
500
Time (in s)
v (in m/s)
0.50
0.25
0.00
−0.25
−0.50
0
100
200
300
400
500
Time (in s)
w (in m/s)
1.0
0.9
0.8
0.7
0
100
200
300
400
500
Time (in s)
p (in radians/s
0.2
0.1
0.0
−0.1
−0.2
0
100
200
300
400
500
Time (in s)
q (in radians/s)
0.3
0.2
0.1
0.0
−0.1
0
100
200
300
400
500
Time (in s)
r (in radians/s)
0.2
0.0
−0.2
−0.4
0
100
200
300
400
500
Time (in s)


delta_e (in radians)
−0.2
−0.4
−0.6
−0.8
0
100
200
300
400
500
Time (in s)
delta_a (in radians)
0.4
0.2
0.0
−0.2
−0.4
Time (in s)
delta_r (in radians)
0.015
0.010
0.005
0.000
−0.005
−0.010
−0.015
Time (in s)
delta_t
1.00
0.75
0.50
0.25
0.00
Time (in s)


z (in meters)
1800
1750
1700
1650
0
1000
2000
3000
4000
5000
6000
x (in meters)
5000
4000
3000
2000
1000
0
y (in meters)