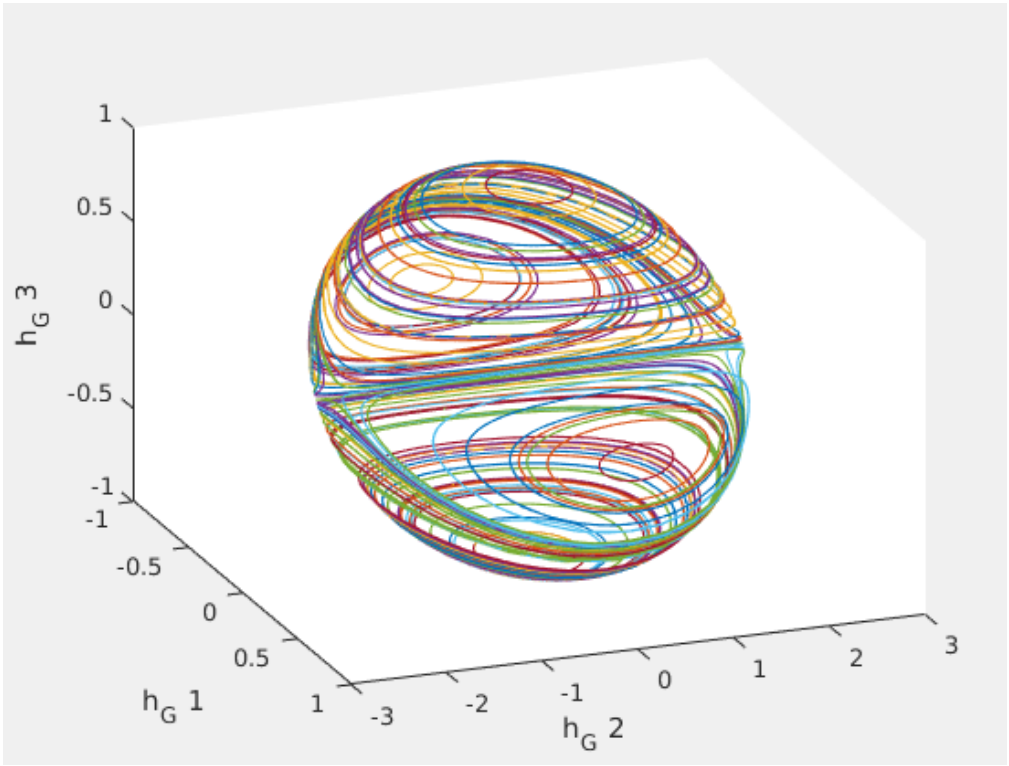
```
clc, clear, close all

t0 = 0;
tf = 100;

N = 100;

I1 = 3;
I2 = 2;
I3 = 1;
mu = 0;

% make initialize omegas and make some random angular momentms
w0 = zeros(3,N);
h0 = randn(3,N);

for i = 1:N
    h0(:,i) = h0(:,i)/norm(h0(:,i));
    w0(1,i) = h0(1,i)/I1;
    w0(2,i) = h0(2,i)/I2;
    w0(3,i) = h0(3,i)/I3;
end

% part D
figure(1), clf
hold on

for i = 1:N
    [t1, y] = ode45(@euler_fun, [t0, tf], w0(:,i));
    plot3(I1*y(:,1), I2*y(:,2)*I2, I3*y(:,3))
end

figure(1)
xlabel('h_G 1')
ylabel('h_G 2')
zlabel('h_G 3')

% part E
[t1, y] = ode45(@euler_fun, [t0, tf], [0.5, 0.01, 0.01]);
[t2, y2] = ode45(@euler_fun, [t0, tf], [0.5, 0.0, 0.0]);

figure(2), clf
plot3(y(:,1), y(:,2), y(:,3), 'r')
hold on
plot3(y2(:,1), y2(:,2), y2(:,3), '*b')
axis equal

[t1, y] = ode45(@euler_fun, [t0, tf], [0.01, 0.5, 0.01]);
[t2, y2] = ode45(@euler_fun, [t0, tf], [0.0, 0.5, 0.0]);

figure(3), clf
plot3(y(:,1), y(:,2), y(:,3), 'r')
hold on
plot3(y2(:,1), y2(:,2), y2(:,3), '*b')
axis equal

[t1, y] = ode45(@euler_fun, [t0, tf], [0.01, 0.01, 0.5]);
[t2, y2] = ode45(@euler_fun, [t0, tf], [0.0, 0.0, 0.5]);
```

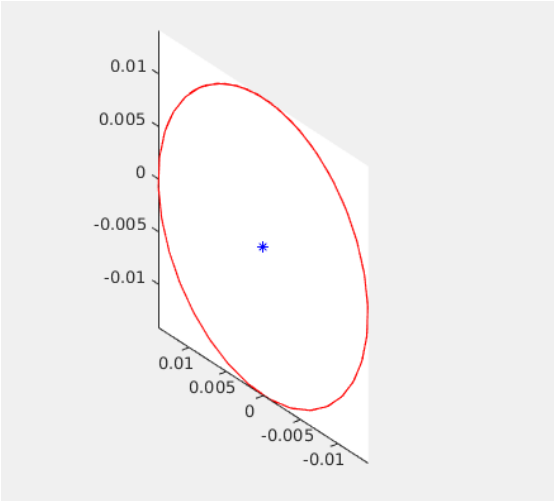
```
figure(4), clf
plot3(y(:,1), y(:,2), y(:,3), 'r')
hold on
plot3(y2(:,1), y2(:,2), y2(:,3), '*b')
axis equal


function [f] = euler_fun(T, Y)
w1 = Y(1,1);
w2 = Y(2,1);
w3 = Y(3,1);

I1 = 3;
I2 = 2;
I3 = 1;
mu = 0;

w1dot = ((I2 - I3)*w2*w3 + mu)/I1;
w2dot = ((I3 - I1)*w1*w3 + mu)/I2;
w3dot = ((I1 - I2)*w1*w2 + mu)/I3;


f = [w1dot, w2dot, w3dot]';
end
```

Plot for part d.)

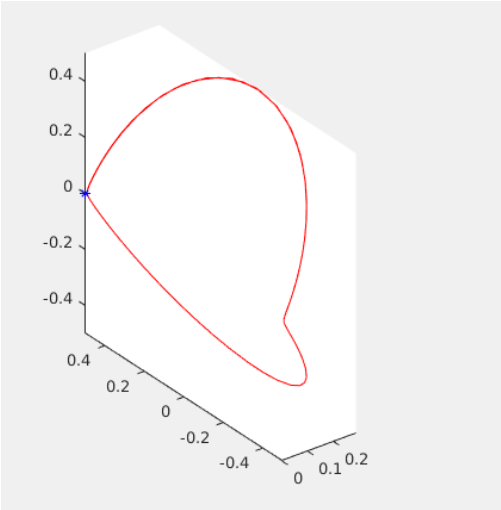


Plots for part d.

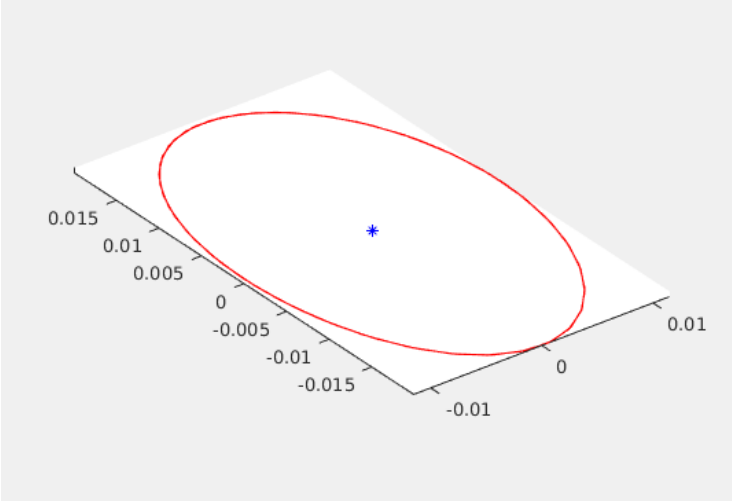
Spun around b1 axis



Spun around b2 axis



Spun around b3 axis



Spinning about an axis very close to the b1 axis seems to cause a stable wobble in w2 and w3 that goes on and on and on.

Spinning about an axis very close to the b2 axis looks like a saddle point and so the spin moves away from the b2 axis.

Spinning about b3 axis causes a stable wobble in w1 and w2 that continues indefinitely.