
```
clear all
close all

ix =100;
iy = 100;
iz = 1000;
sim('model')

tol=.01;

for i = 2:length(u)
    if mean(abs(u(i,4))+abs(u(i+1,4))+abs(u(i+2,4))+abs(u(i
+3,4))+abs(u(i+4,4))) < tol
        u1_end = i;
        break
    end
end
for i = 2:length(u)
    if mean(abs(u(i,5))+abs(u(i+1,5))+abs(u(i+2,5))+abs(u(i
+3,5))+abs(u(i+4,5))) < tol
        u2_end = i;
        break
    end
end
tol=.0001;

for i = 2:length(u)
    if mean(abs(u(i,6))+abs(u(i+1,6))+abs(u(i+2,6))+abs(u(i
+3,6))+abs(u(i+4,6))) < tol
        u3_end = i;
        break
    end
end

figure(1)
plot(tout,u(:,4))
hold on
plot(u1_end/100,0,'o')
title('X-Axis Body Rates')
xlabel('Time (s)')
ylabel('Body Rates (rad/s)')
xlim([0,120])
text(50,1,'Stabilizes at t=48.93 seconds')

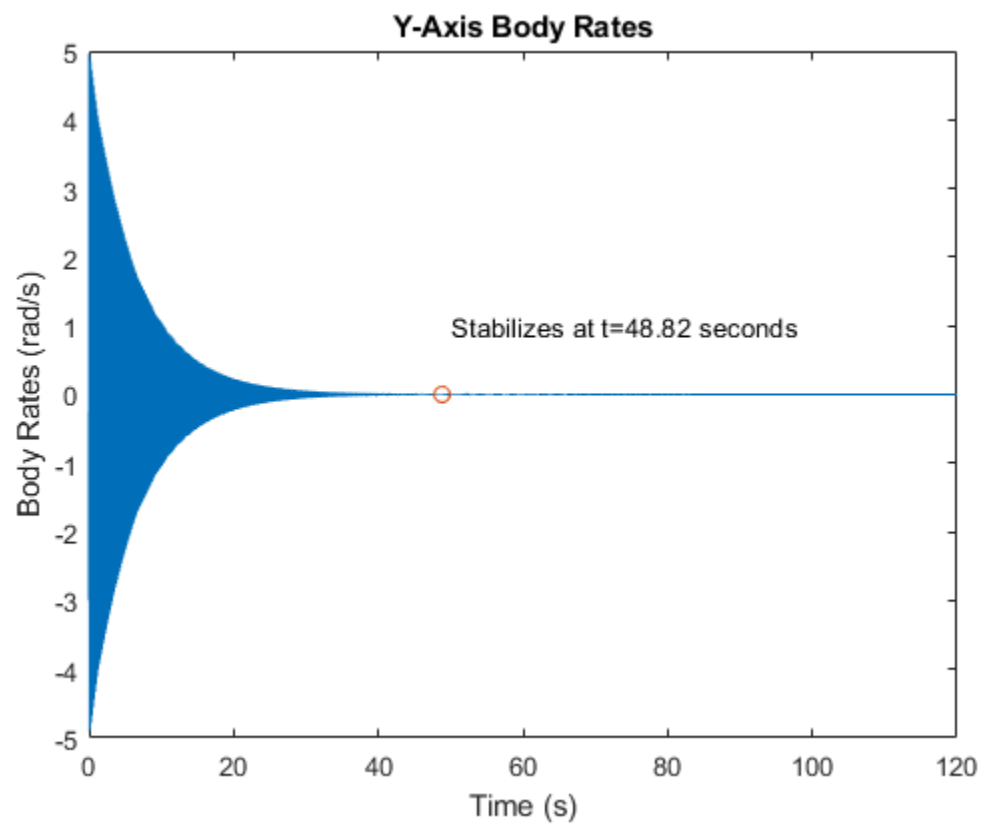
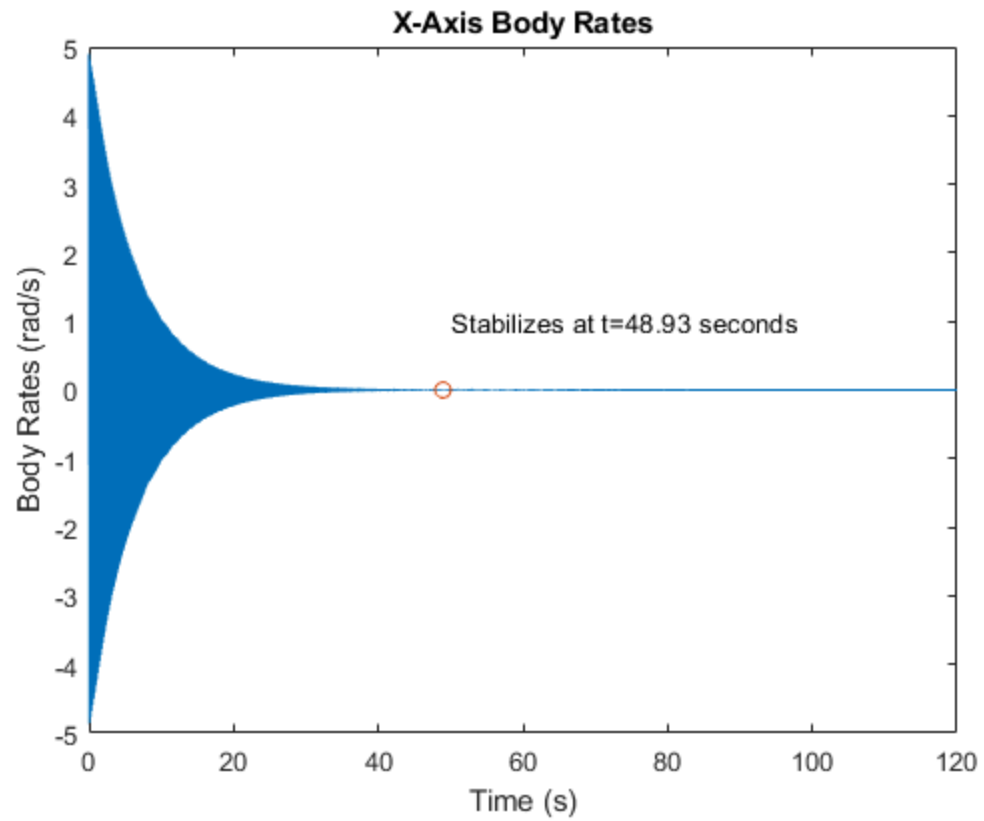
figure(2)
plot(tout,u(:,5))
hold on
plot(u2_end/100,0,'o')
title('Y-Axis Body Rates')
xlabel('Time (s)')
ylabel('Body Rates (rad/s)')
```

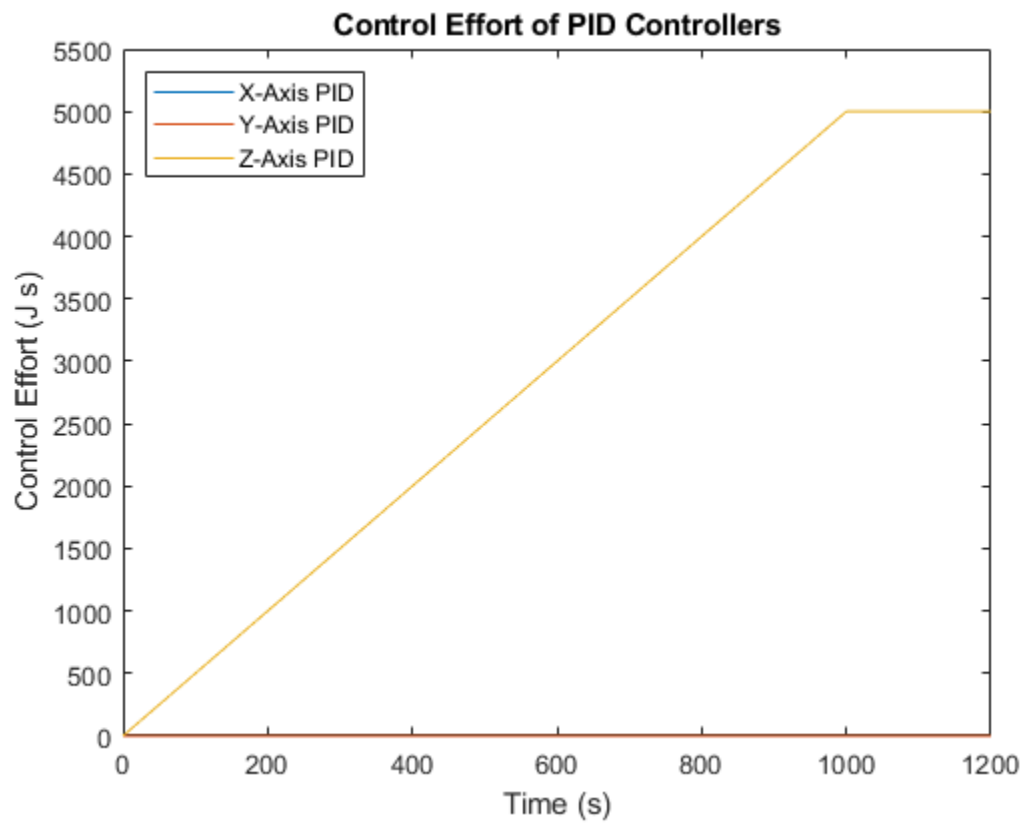
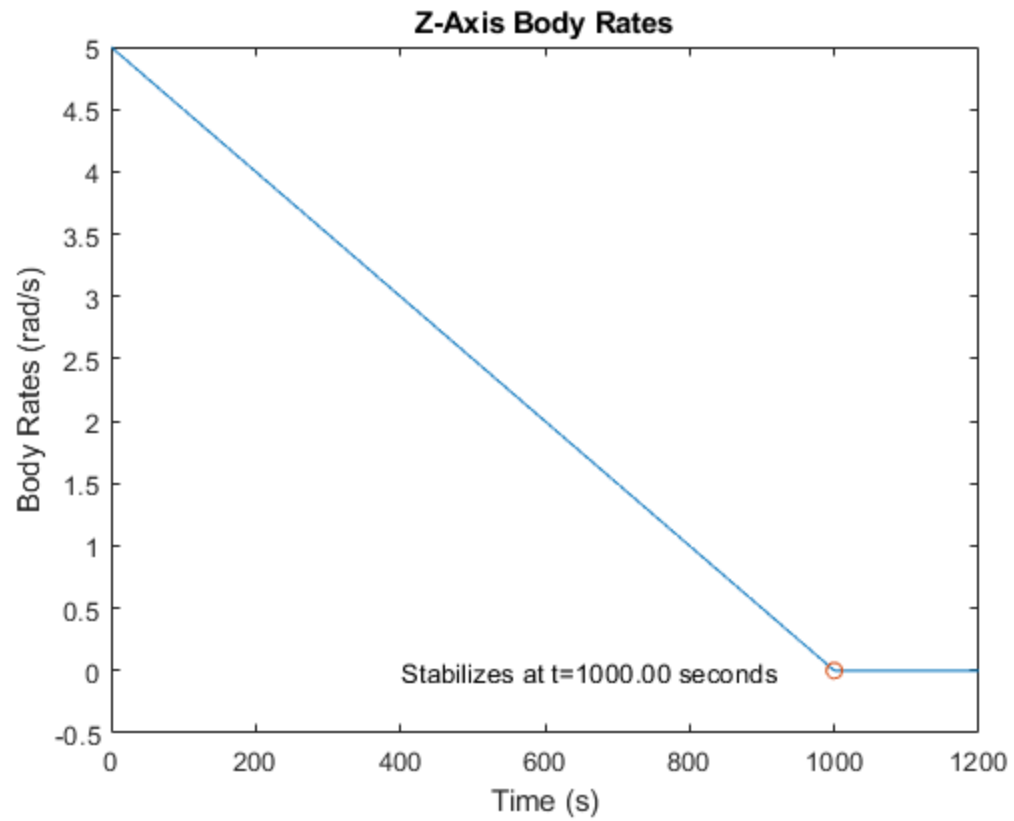
```
xlim([0,120])
text(50,1,'Stabilizes at t=48.82 seconds')

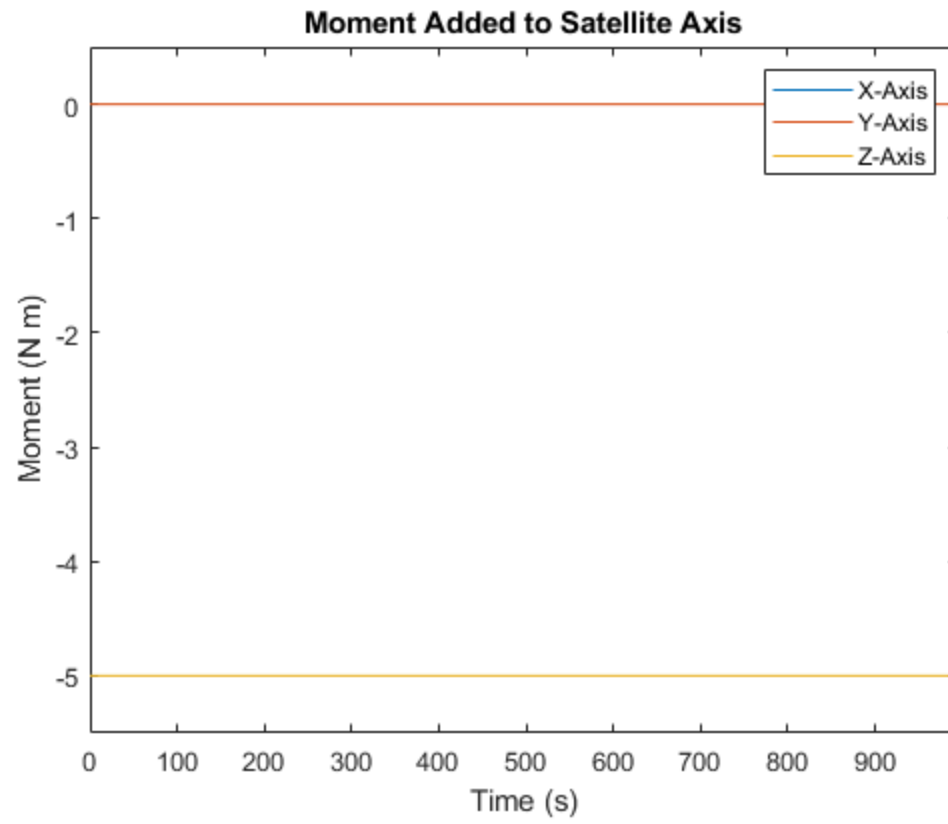
figure(3)
plot(tout,u(:,6))
hold on
plot(u3_end/100,0,'o')
title('Z-Axis Body Rates')
xlabel('Time (s)')
ylabel('Body Rates (rad/s)')
xlim([0,1200])
ylim([-0.5,5])
text(400,0,'Stabilizes at t=1000.00 seconds')

figure(4)
plot(tout,controleffort(:,1))
hold on
plot(tout,controleffort(:,2))
plot(tout,controleffort(:,3))
title('Control Effort of PID Controllers')
xlabel('Time (s)')
ylabel('Control Effort (J s)')
xlim([0,1200])
ylim([0,5500])
legend('X-Axis PID','Y-Axis PID','Z-Axis PID','location','northwest')

figure(5)
plot(tout,u(:,1))
hold on
plot(tout,u(:,2))
plot(tout,u(:,3))
title('Moment Added to Satellite Axis')
xlabel('Time (s)')
ylabel('Moment (N m)')
xlim([0,995])
ylim([-5.5,.5])
legend('X-Axis','Y-Axis','Z-Axis')
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