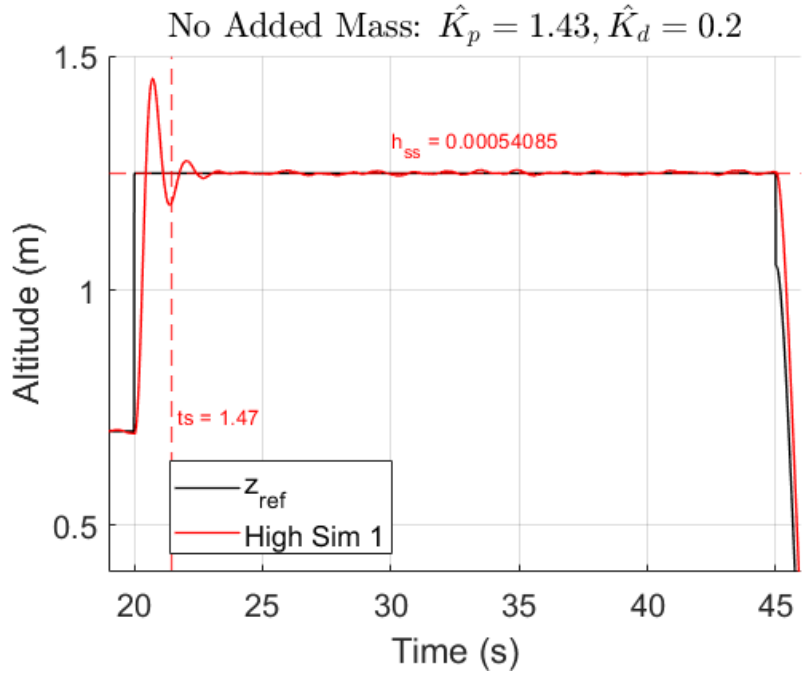
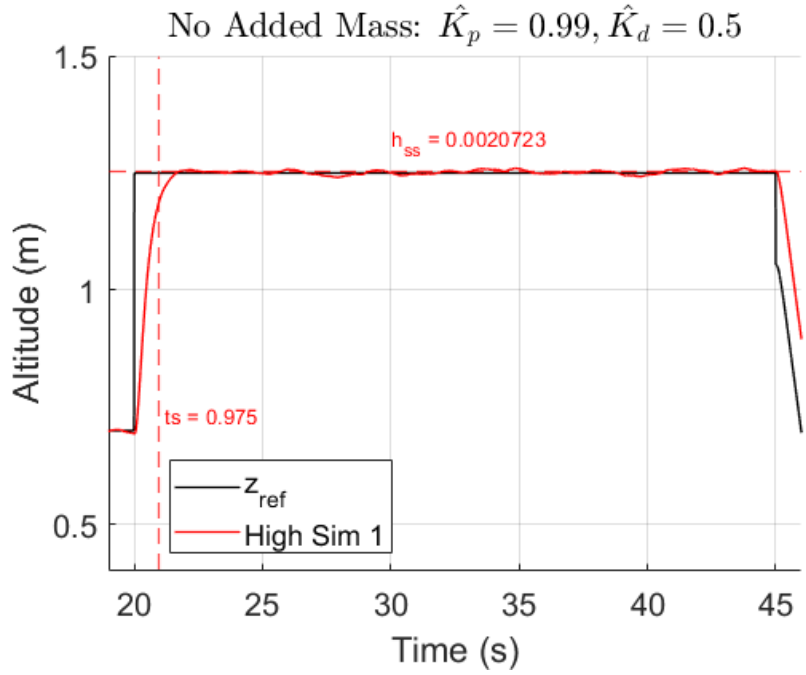
High-Fidelity, No Mass Sims

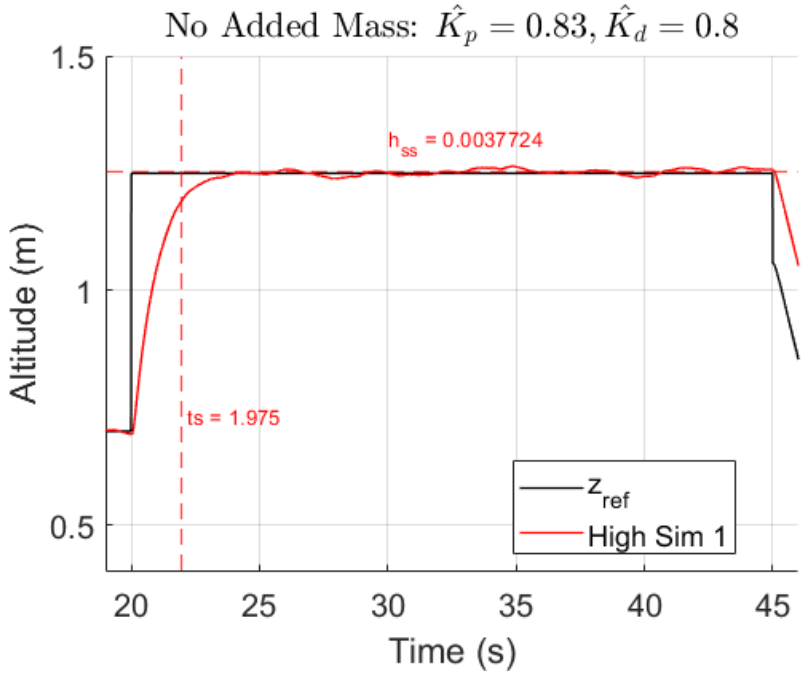
Trevor Burgoyne 13 Nov 2022

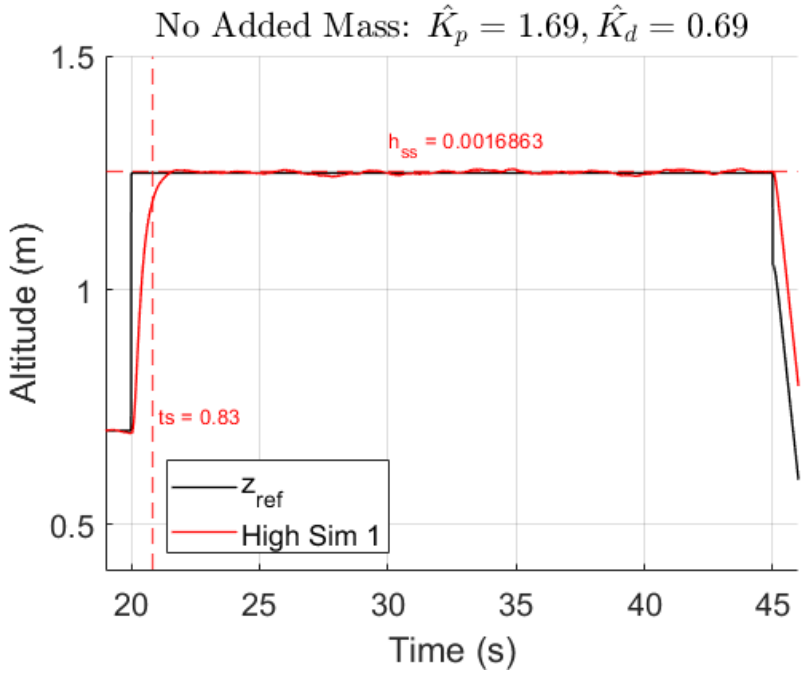
```
% Paths for data loading
ROOT_DIR = "C:/Users/Trevor/Desktop/AEM 4602W/Controls-Lab/Data/Part 2/";
PREFIX = "sim_t";
DISP_NAME = "No Added Mass";
LABEL_NAME = "High Sim";
N_TESTS = 6;
N_RUNS = 1;
masses = 69*ones(1,N_TESTS)/1000; % kg
[avg_hss, var_hss, avg_kt, var_kt, kphat, kdhat, kp, kd] = make_graphs(ROOT_DIR, PREFIX, DISP_NAME, LABEL_NAME, N_TESTS, N_RUNS, masses)
```

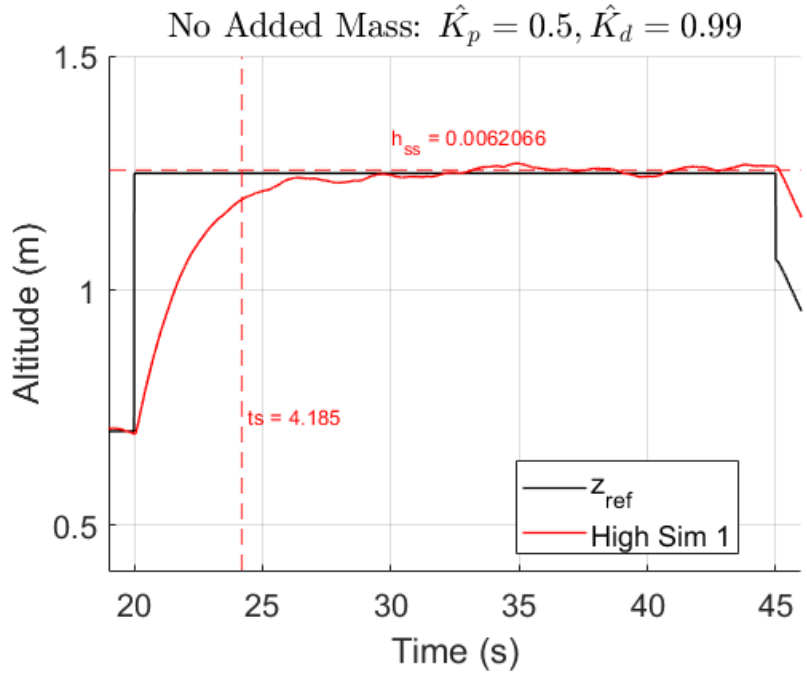
```
avg_hss =

    0.0005    0.0021    0.0038    0.0017    0.0062    0.0042


var_hss =

     0     0     0     0     0     0


avg_kt =

    0.6815    0.6669    0.6489    0.6615    0.6534    0.6536


var_kt =

     0     0     0     0     0     0


kphat =

    1.4300    0.9900    0.8300    1.6900    0.5000    0.1000


kdhat =

    0.2000    0.5000    0.8000    0.6900    0.9900    0.1000


kp =

    0.5245    0.3711    0.3198    0.6387    0.1913    0.0383


kd =

    0.0734    0.1874    0.3082    0.2608    0.3788    0.0383
```

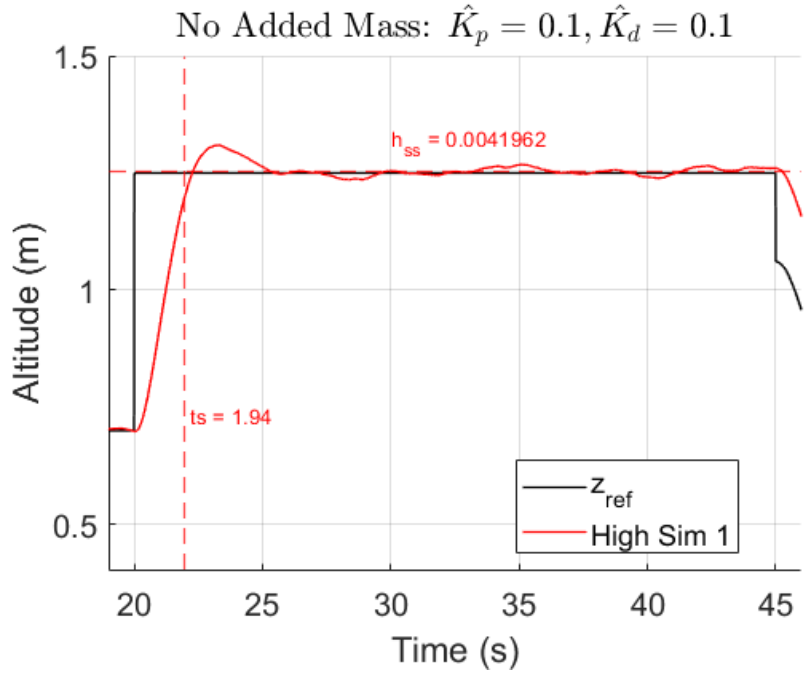

No Added Mass: $\hat{K}_p = 1.43, \hat{K}_d = 0.2$
1.5
1
0.5
Altitude (m)
h_ss = 0.00054085
ts = 1.47
z_ref
High Sim 1
20
25
30
35
40
45
Time (s)


No Added Mass: $\hat{K}_p = 0.99, \hat{K}_d = 0.5$
1.5
1
0.5
Altitude (m)
h_ss = 0.0020723
ts = 0.975
z_ref
High Sim 1
20
25
30
35
40
45
Time (s)


No Added Mass: $\hat{K}_p = 0.83, \hat{K}_d = 0.8$
1.5
1
0.5
Altitude (m)
h_{ss} = 0.0037724
ts = 1.975
z_{ref}
High Sim 1
20
25
30
35
40
45
Time (s)


No Added Mass: $\hat{K}_p = 1.69, \hat{K}_d = 0.69$
1.5
1
0.5
Altitude (m)
h_{ss} = 0.0016863
ts = 0.83
z_{ref}
High Sim 1
20
25
30
35
40
45
Time (s)





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