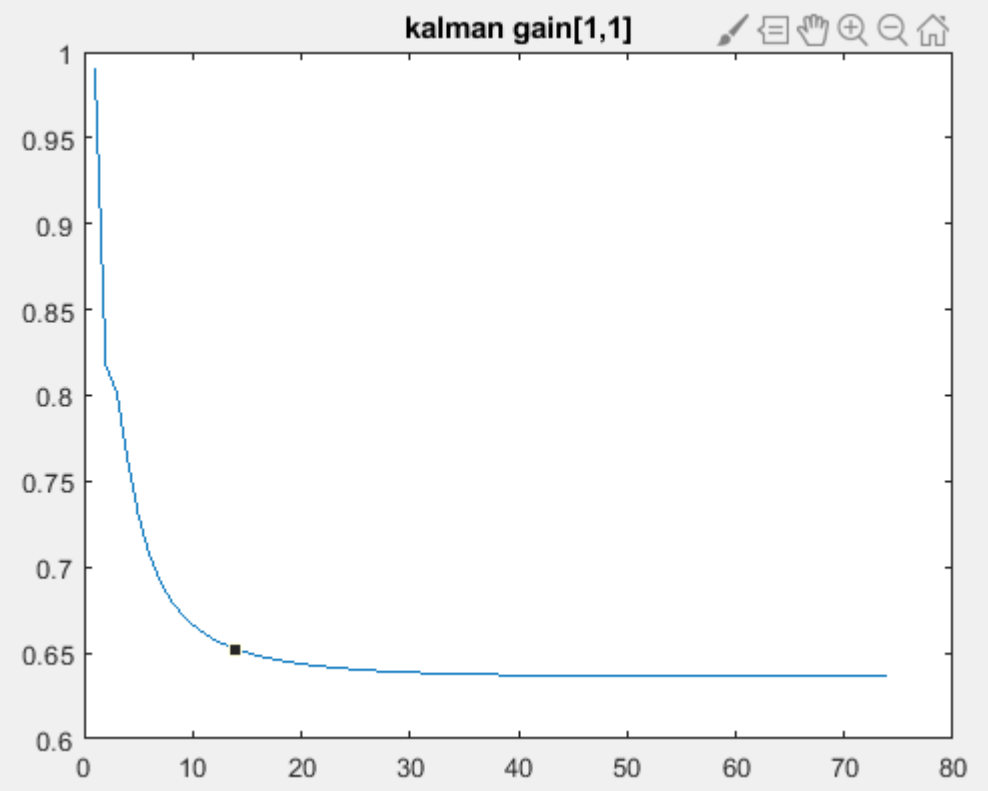
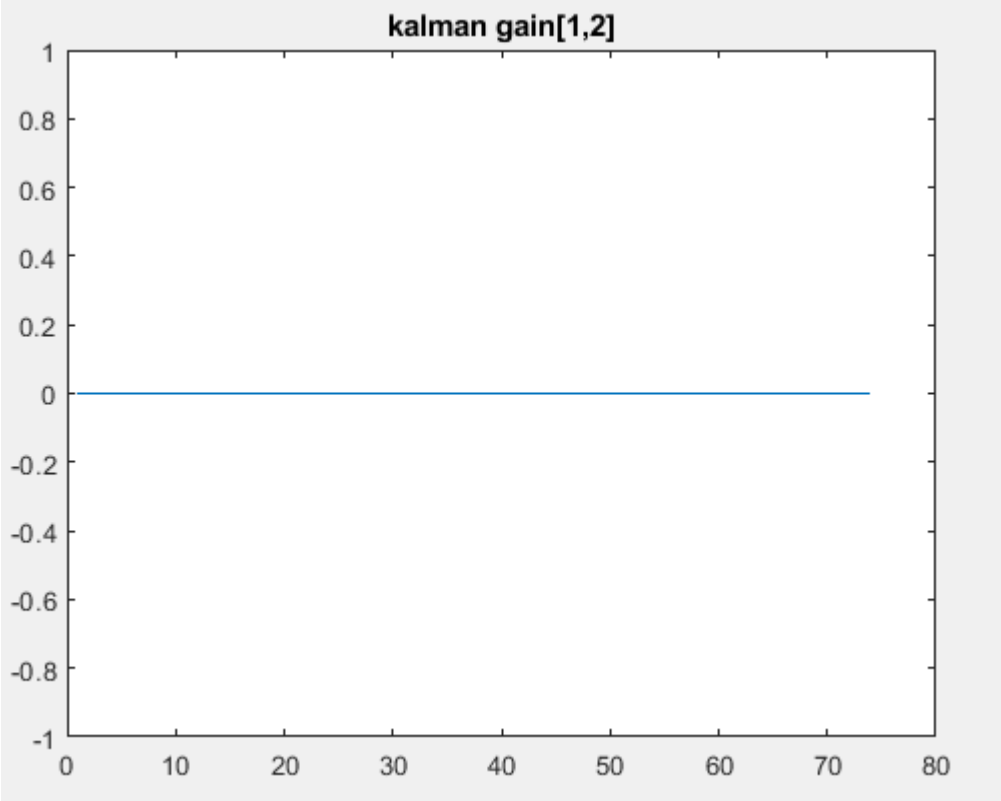
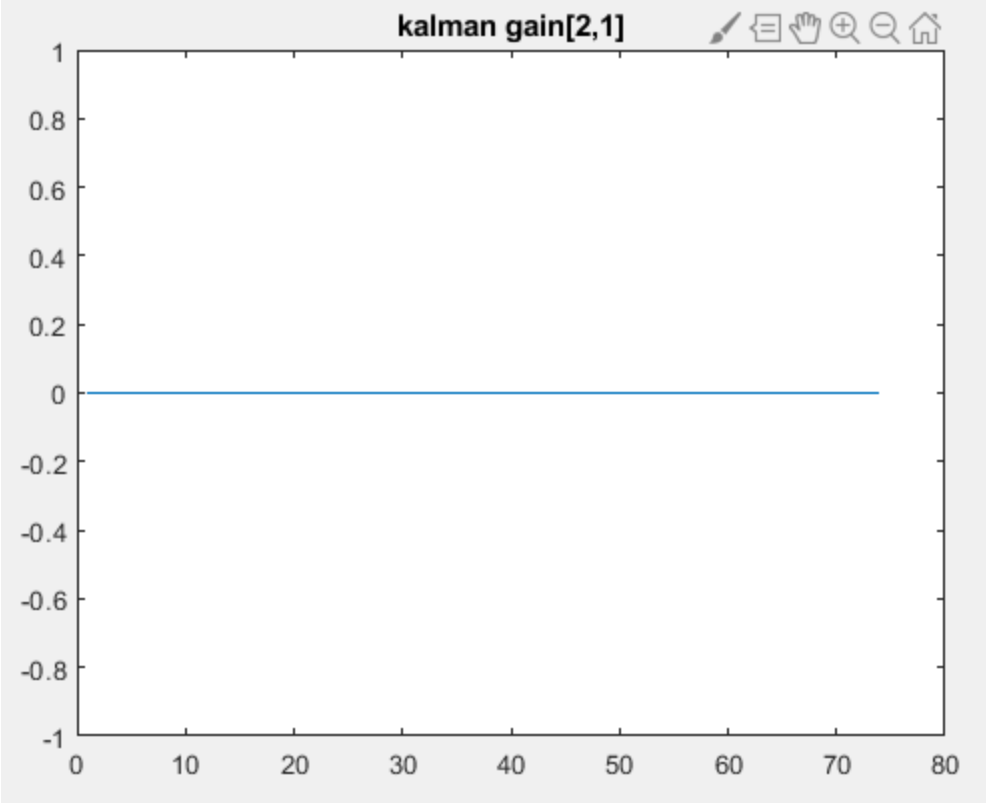
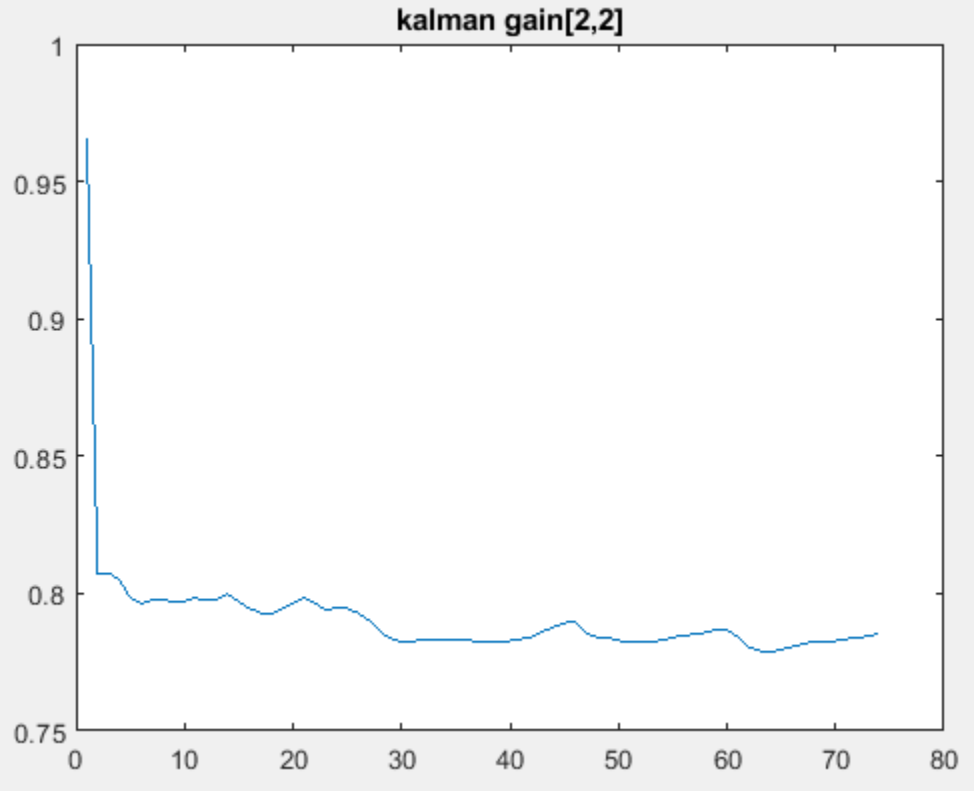
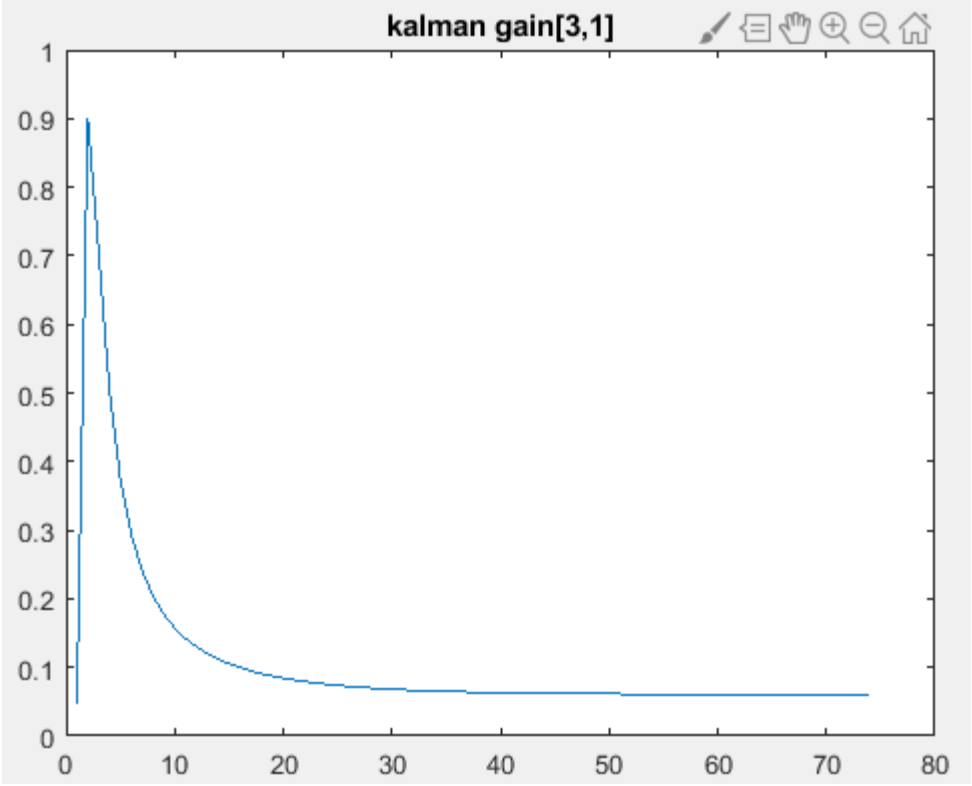
2.

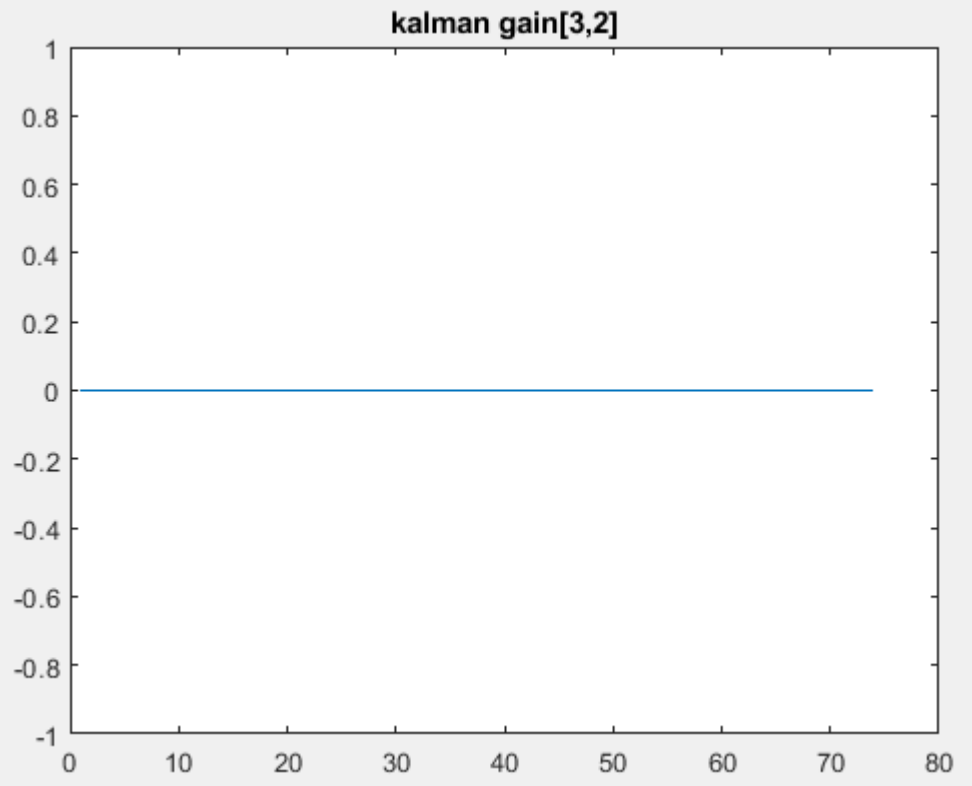

kalman gain[1,1]
1
0.95
0.9
0.85
0.8
0.75
0.7
0.65
0.6
0
10
20
30
40
50
60
70
80

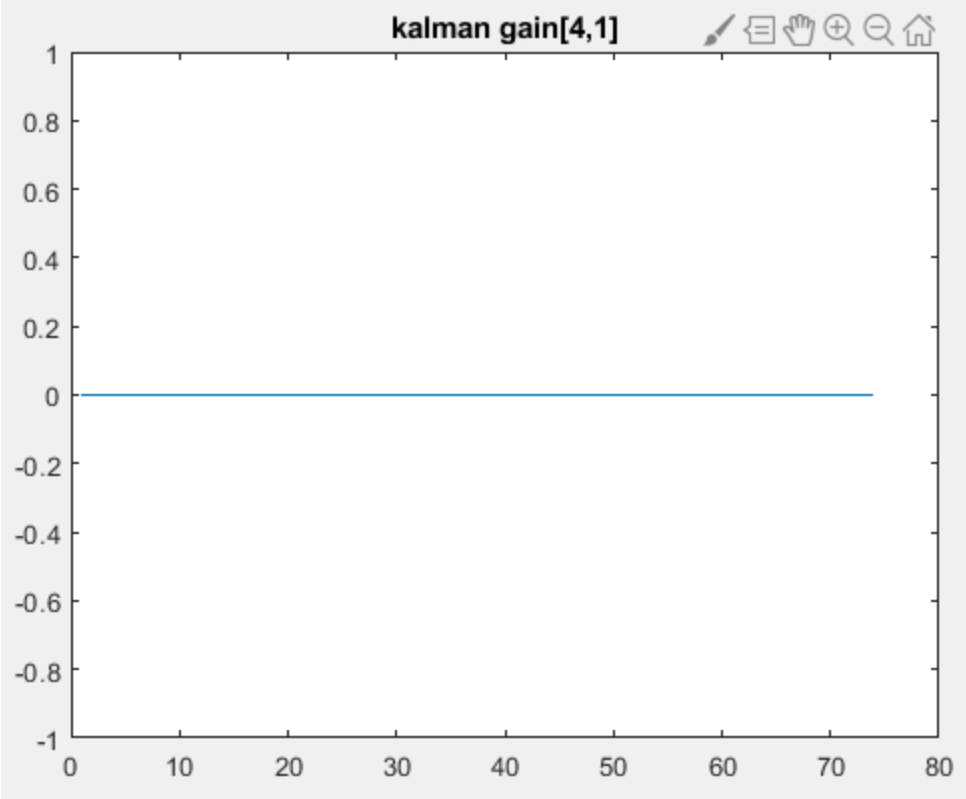

kalman gain[1,2]
1
0.8
0.6
0.4
0.2
0
-0.2
-0.4
-0.6
-0.8
-1
0
10
20
30
40
50
60
70
80

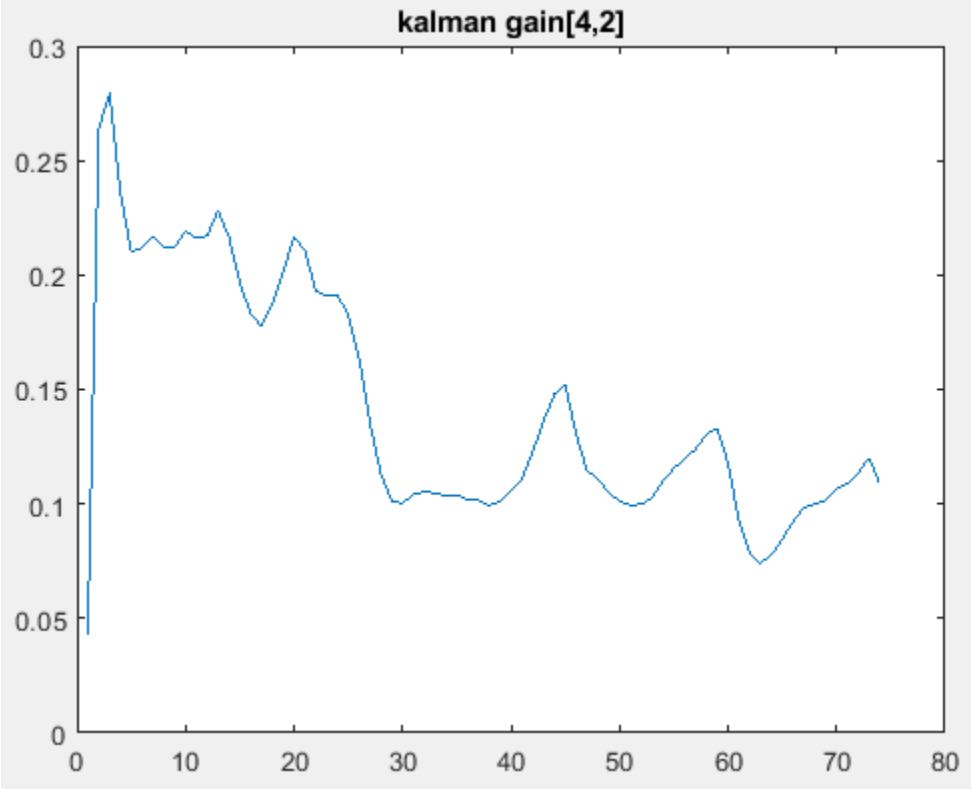

kalman gain[2,1]
1
0.8
0.6
0.4
0.2
0
-0.2
-0.4
-0.6
-0.8
-1
0
10
20
30
40
50
60
70
80

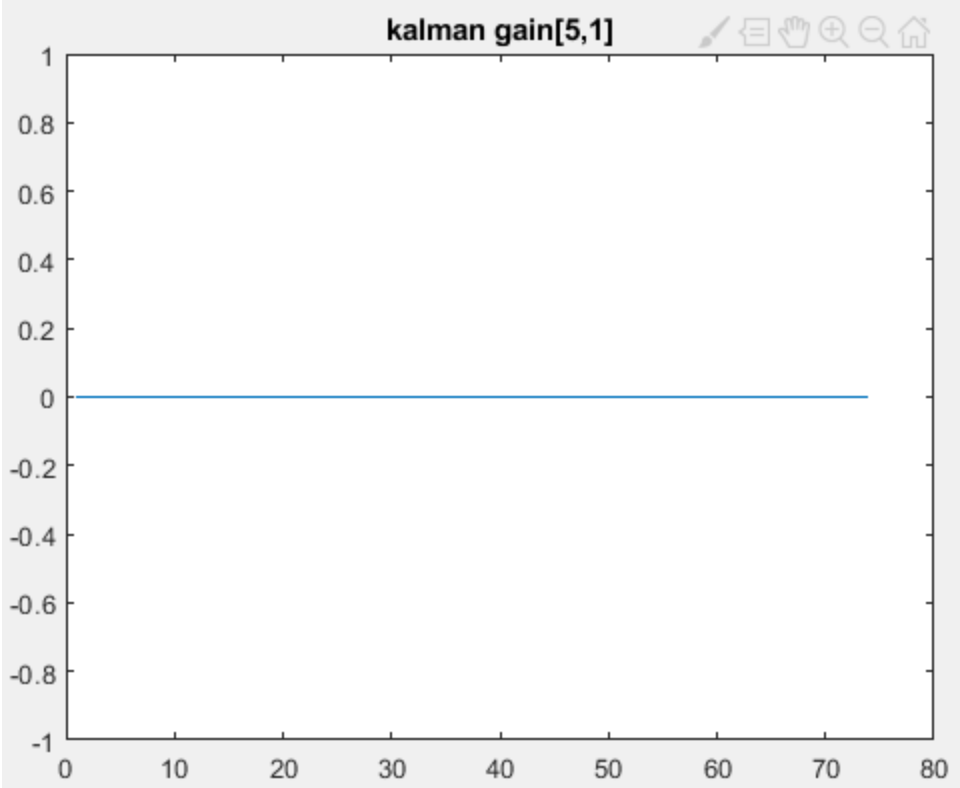

kalman gain[2,2]
1
0.95
0.9
0.85
0.8
0.75
0
10
20
30
40
50
60
70
80

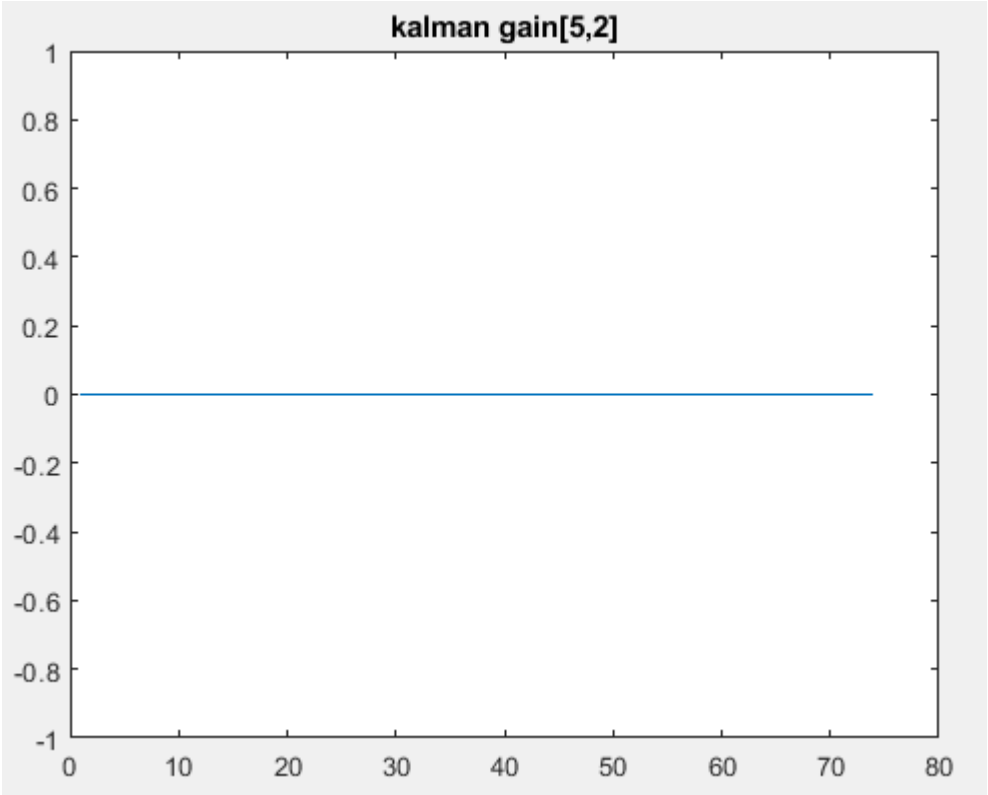

kalman gain[3,1]
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
0
10
20
30
40
50
60
70
80

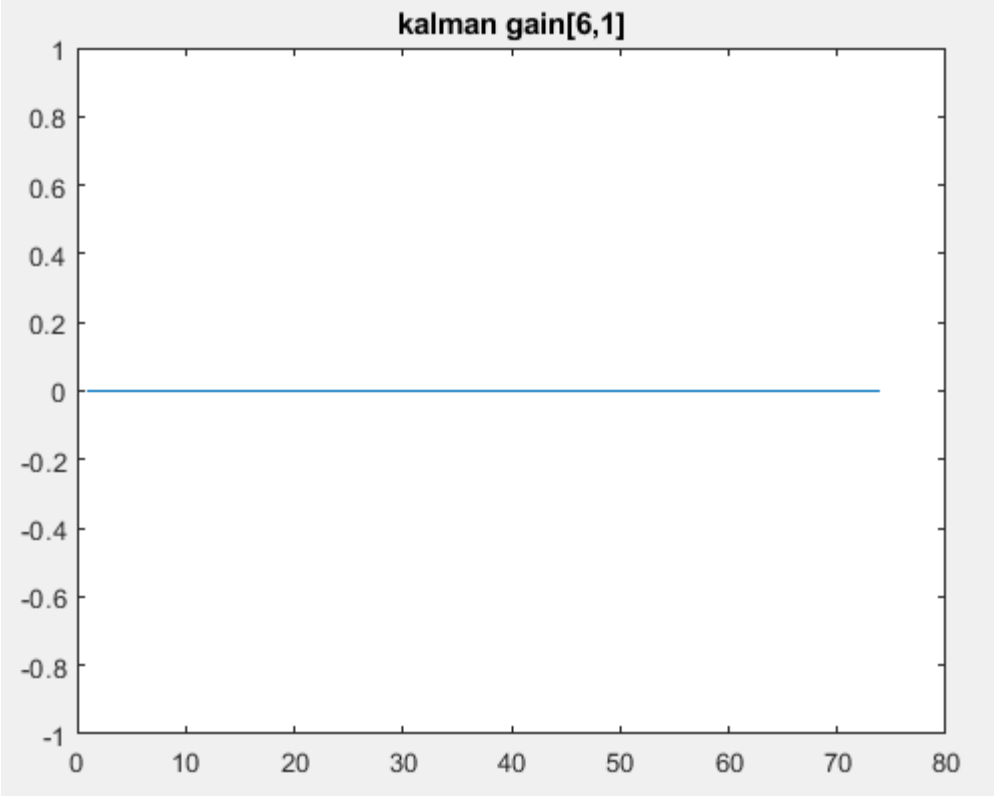

kalman gain[3,2]
1
0.8
0.6
0.4
0.2
0
-0.2
-0.4
-0.6
-0.8
-1
0
10
20
30
40
50
60
70
80

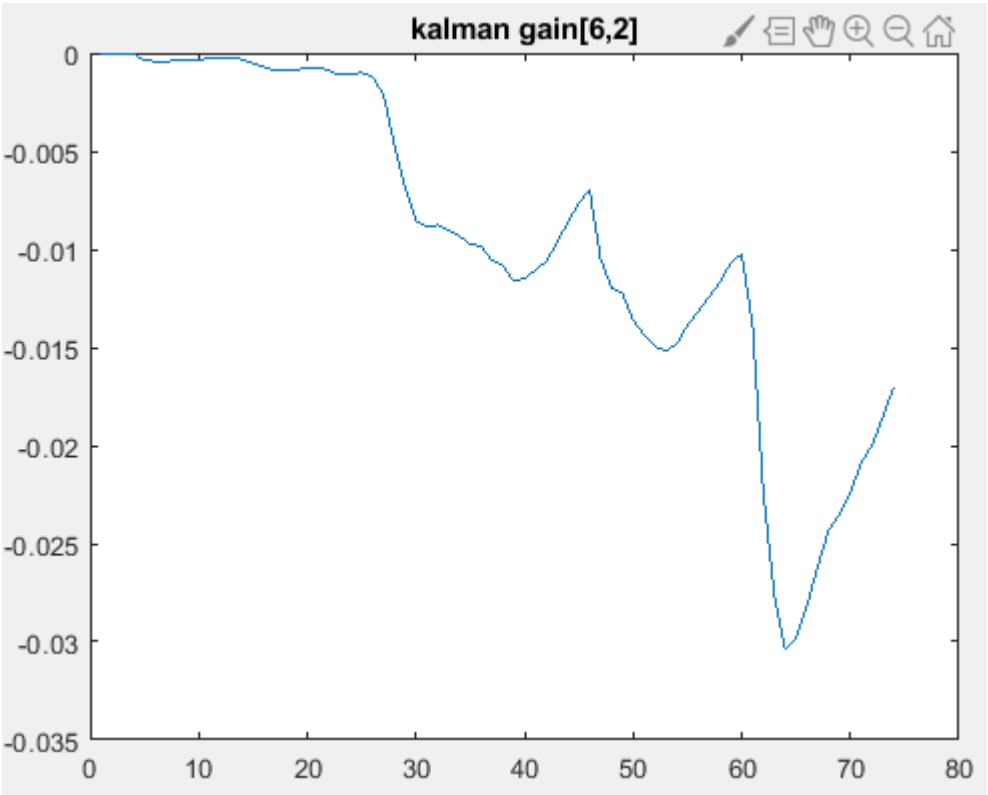

kalman gain[4,1]
1
0.8
0.6
0.4
0.2
0
-0.2
-0.4
-0.6
-0.8
-1
0
10
20
30
40
50
60
70
80

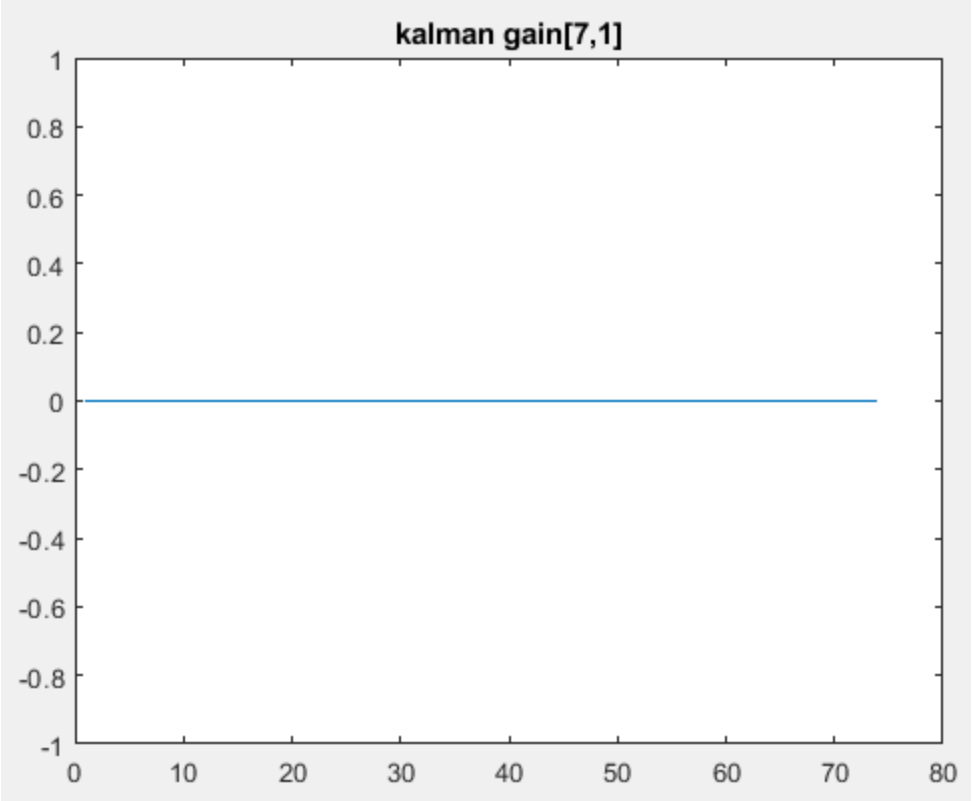

kalman gain[4,2]
0.3
0.25
0.2
0.15
0.1
0.05
0
0
10
20
30
40
50
60
70
80

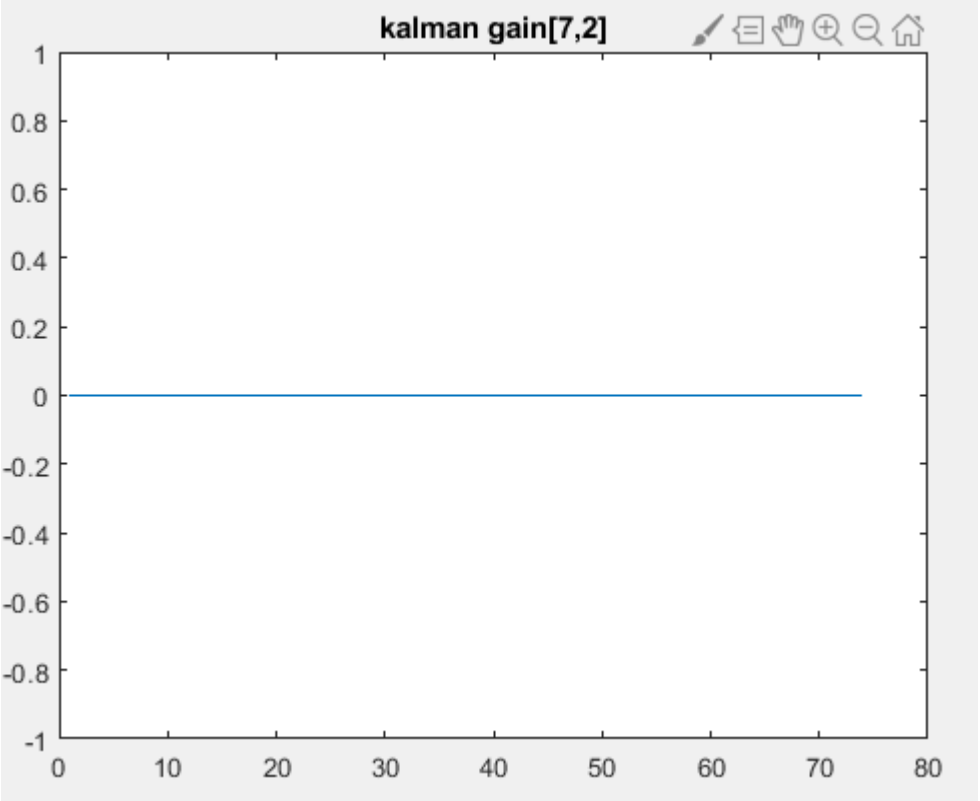

kalman gain[5,1]
1
0.8
0.6
0.4
0.2
0
-0.2
-0.4
-0.6
-0.8
-1
0
10
20
30
40
50
60
70
80

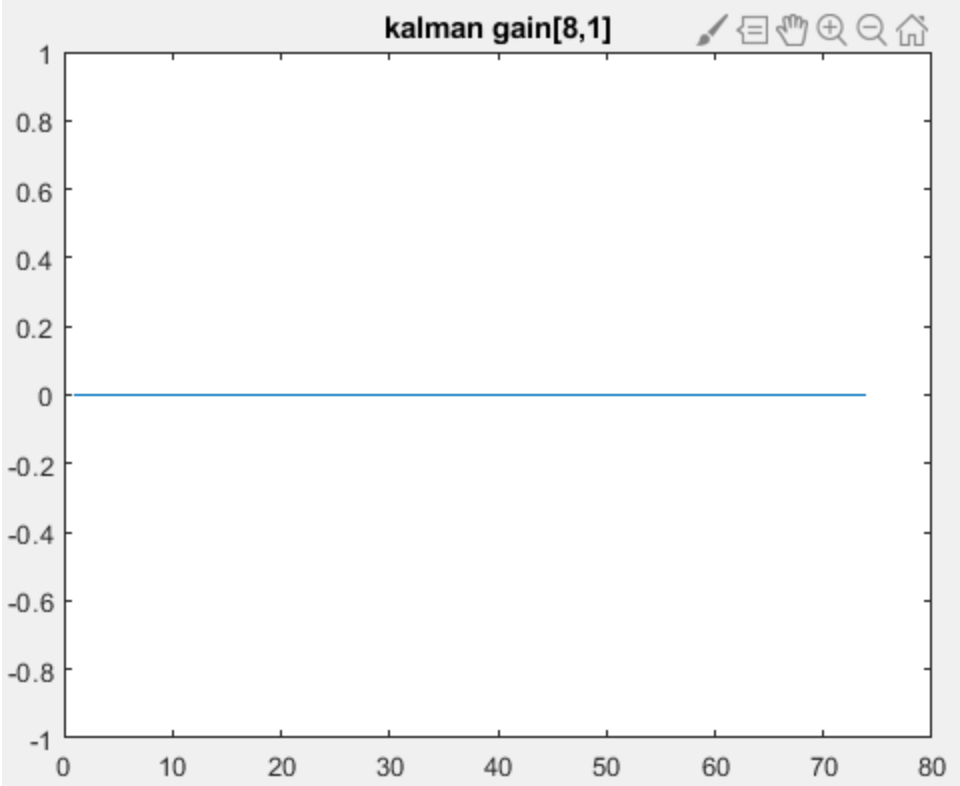

kalman gain[5,2]
1
0.8
0.6
0.4
0.2
0
-0.2
-0.4
-0.6
-0.8
-1
0
10
20
30
40
50
60
70
80

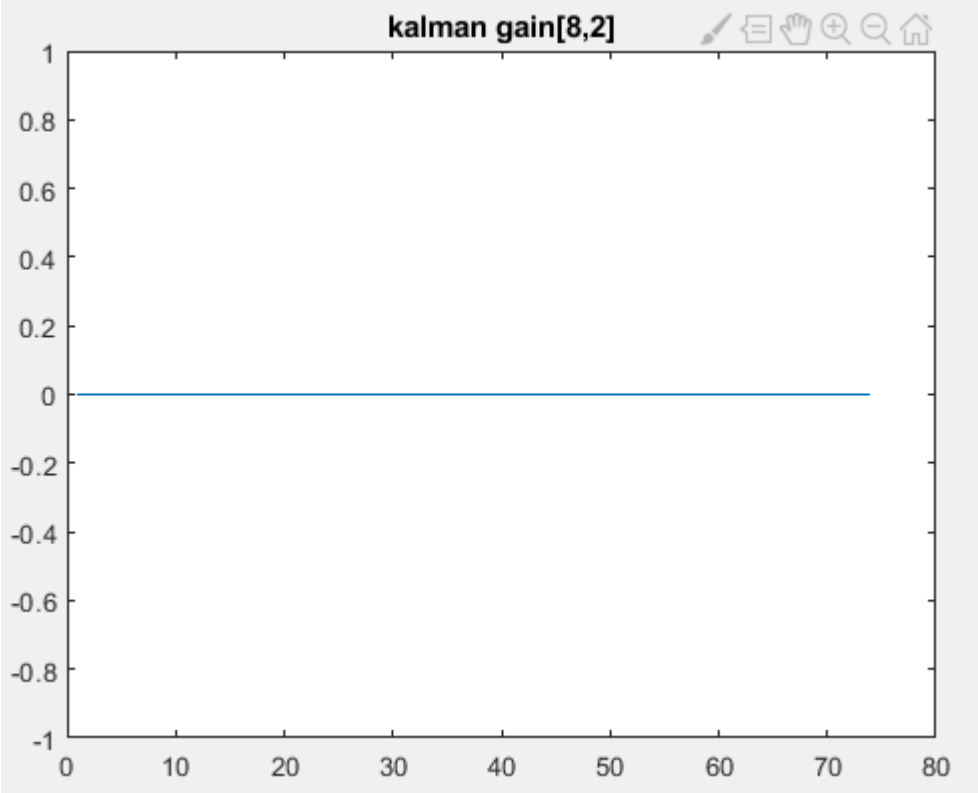

kalman gain[6,1]
1
0.8
0.6
0.4
0.2
0
-0.2
-0.4
-0.6
-0.8
-1
0
10
20
30
40
50
60
70
80


kalman gain[6,2]
0
-0.005
-0.01
-0.015
-0.02
-0.025
-0.03
-0.035
0
10
20
30
40
50
60
70
80


kalman gain[7,1]
1
0.8
0.6
0.4
0.2
0
-0.2
-0.4
-0.6
-0.8
-1
0
10
20
30
40
50
60
70
80


kalman gain[7,2]
1
0.8
0.6
0.4
0.2
0
-0.2
-0.4
-0.6
-0.8
-1
0
10
20
30
40
50
60
70
80


kalman gain[8,1]
1
0.8
0.6
0.4
0.2
0
-0.2
-0.4
-0.6
-0.8
-1
0
10
20
30
40
50
60
70
80


kalman gain[8,2]
1
0.8
0.6
0.4
0.2
0
-0.2
-0.4
-0.6
-0.8
-1
0
10
20
30
40
50
60
70
80

3.

	Group	Name
Initial Covariance	1	Uncertainty for $Position$
	2	Uncertainty for *Velocity*
	3	Uncertainty for coefficients of aero drag magnitude
Process Noise	4	Position process noise
	5	Velocity process noise
	6	Coefficients process noise
Measurement Noise	7	Velocity measure noise

4.

Error Group	Position		Velocity		Drag Coefficients			
	r_x	r_y	v_x	v_y	Δh	$\Delta \beta$	$\Delta \rho_0$	Δk_p
1	9.04	20.94	7.85	13.4	0	0	0	0
2	10.24	20.16	9.85	11.5	0	0	0	0
3	10.24	20.7	9.85	12.2	0.1	7.35	0.1	7.35
4	11.8	21.8	11.2	12.65	0.1	7.5	0	0
5	31.9	12.32	20.25	23.09	0.1	7.5	0	0
6	3.36	25.7	7.24	12.99	20.4	53.85	0	0
7	5.61	12.4	10.6	15.33	0.1	13.21	0	0

5.

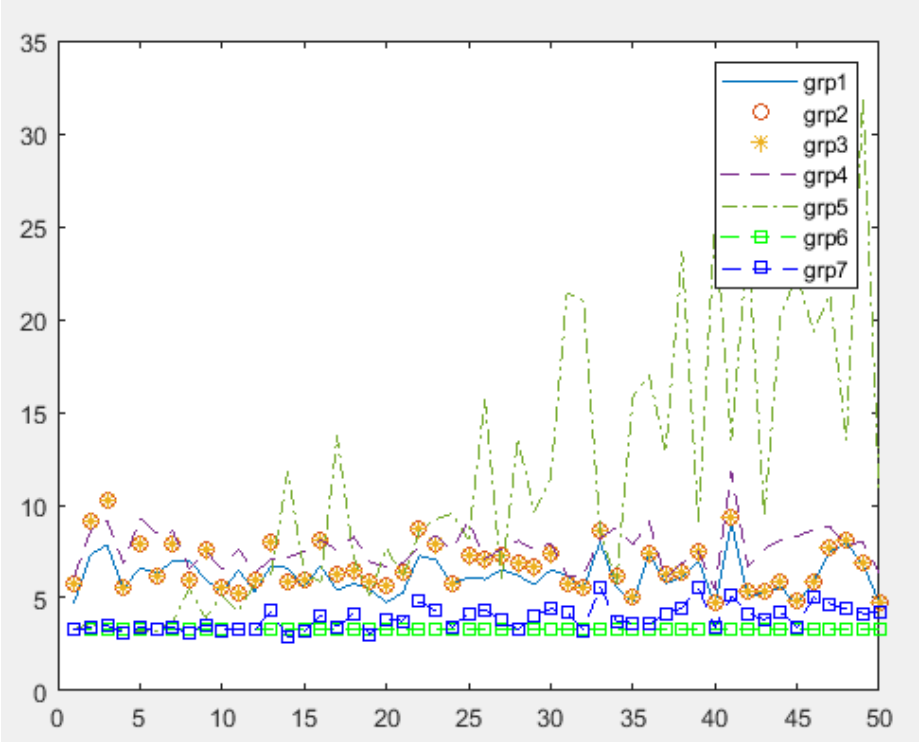


Fig1.Error Sensitivity for r_x

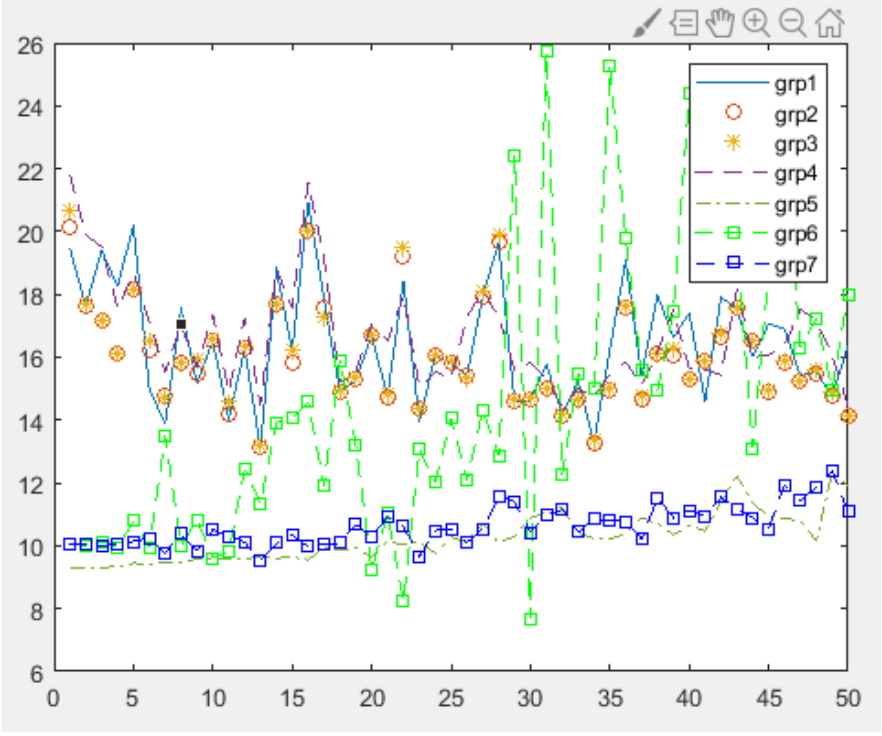


Fig2. Error Sensitivity for r_y

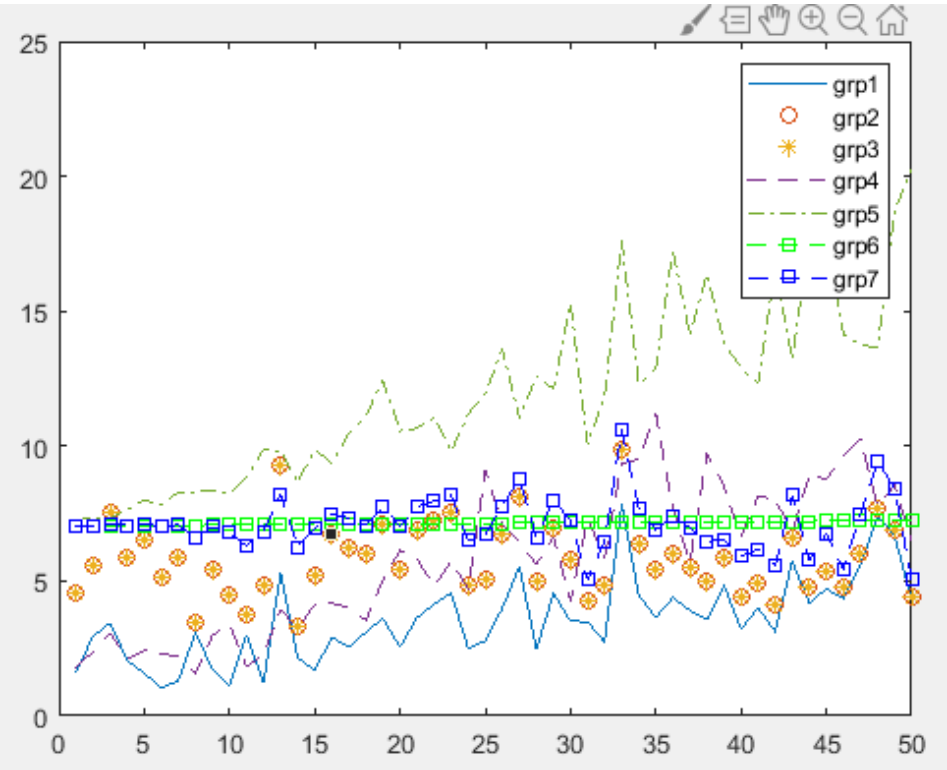


Fig3. Error Sensitivity for v_x

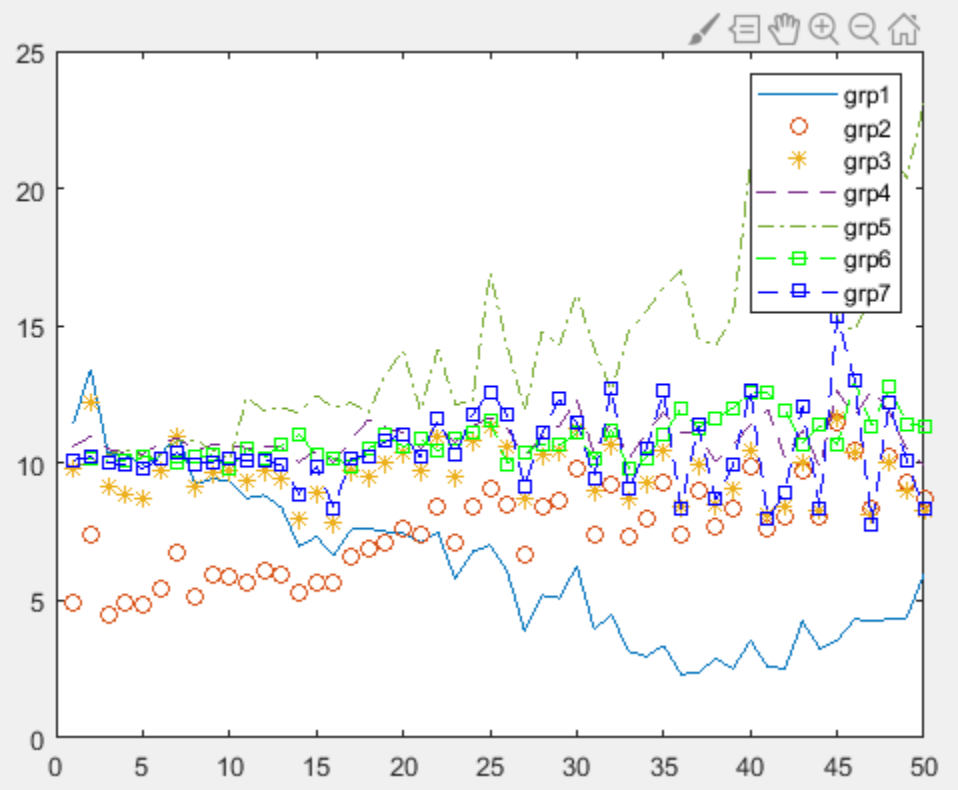


Fig4. Error Sensitivity for v_y

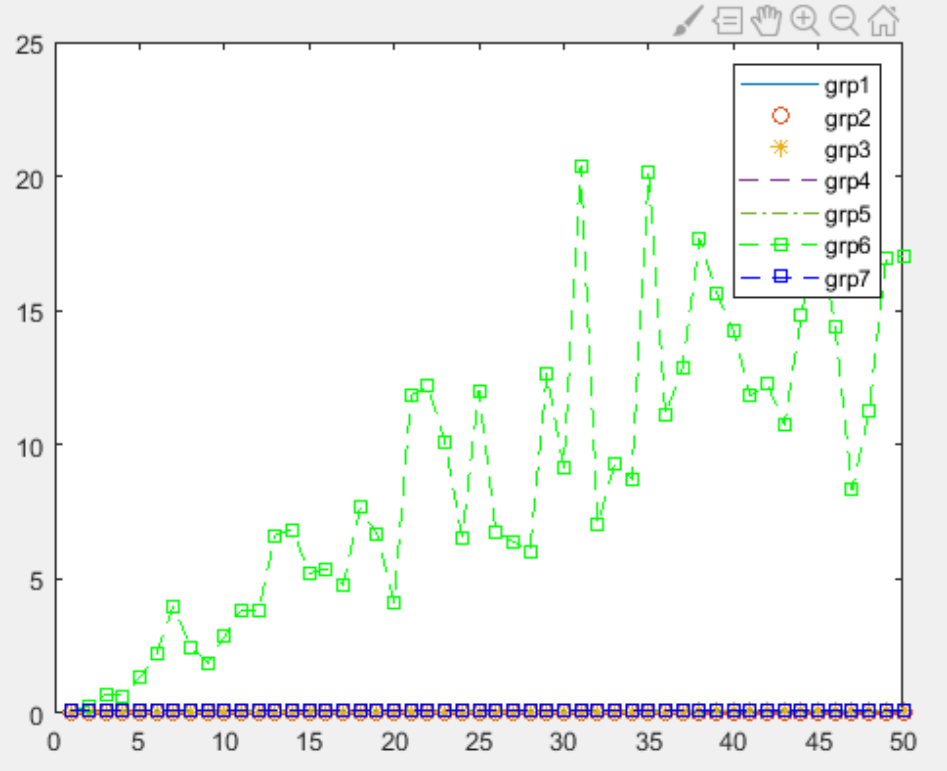


Fig5. Error Sensitivity for Δh

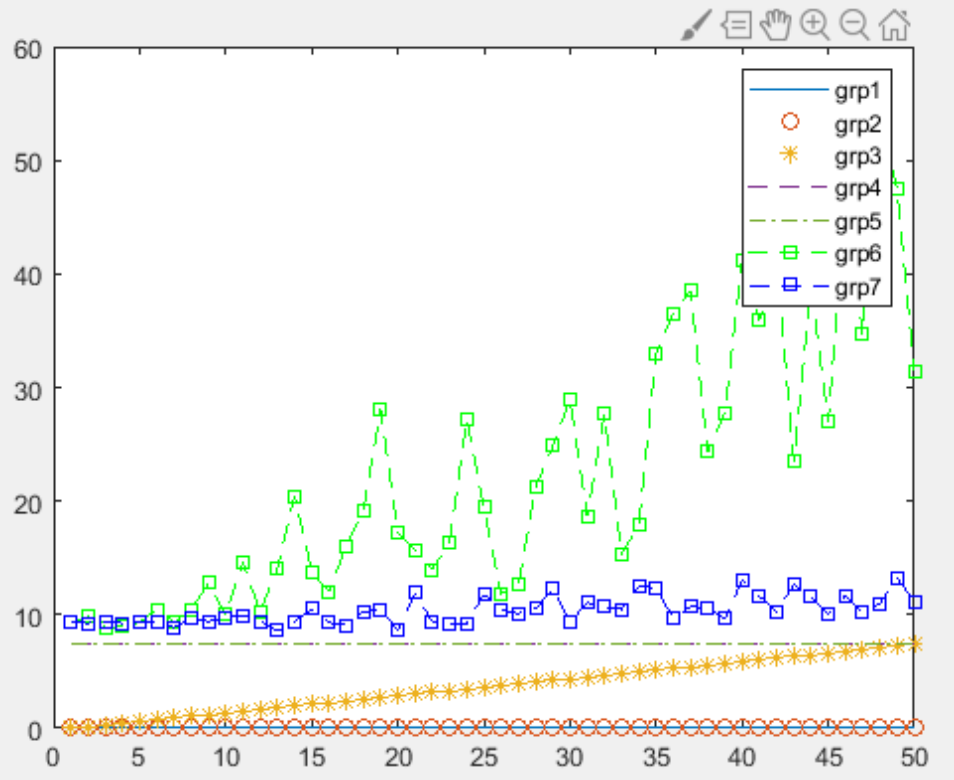


Fig6. Error Sensitivity for $\Delta \beta$

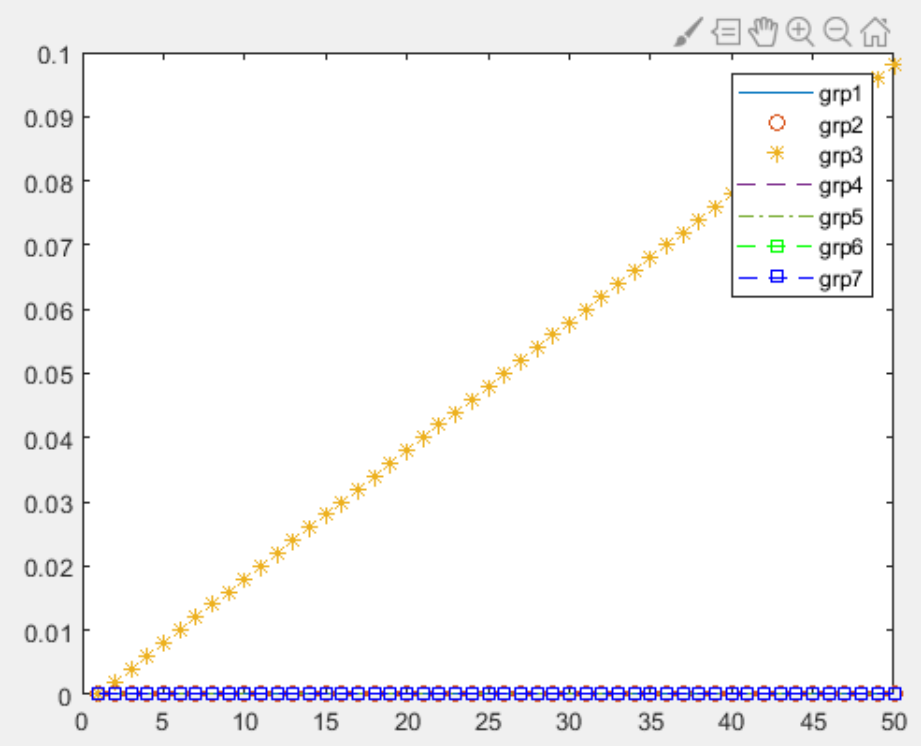


Fig7. Error Sensitivity for $\Delta\rho_0$

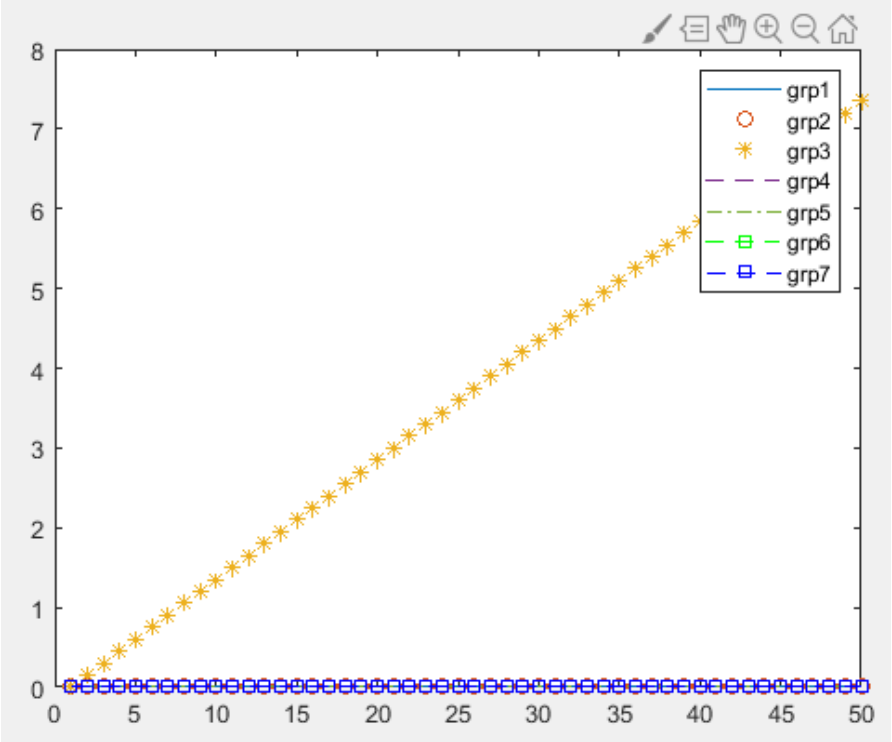


Fig8. Error Sensitivity for Δk_p