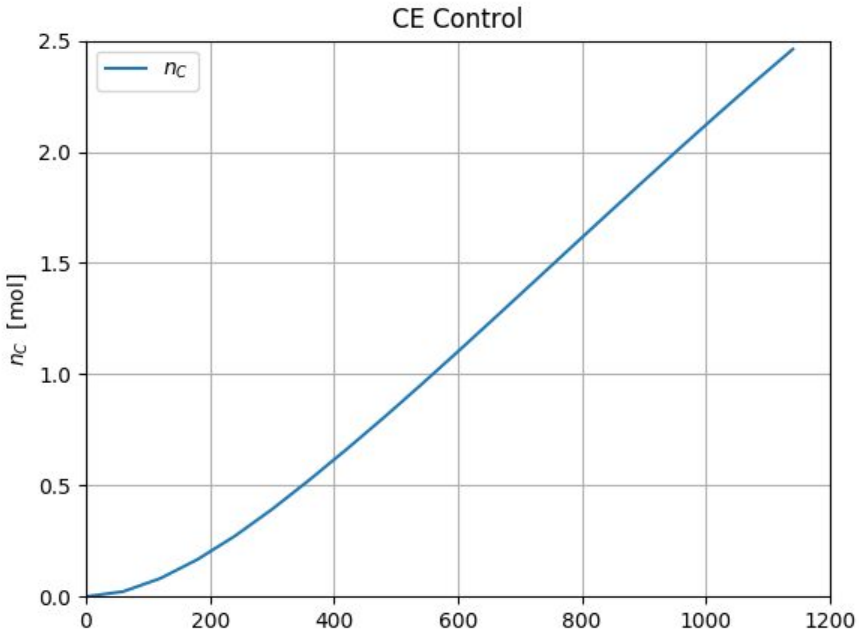
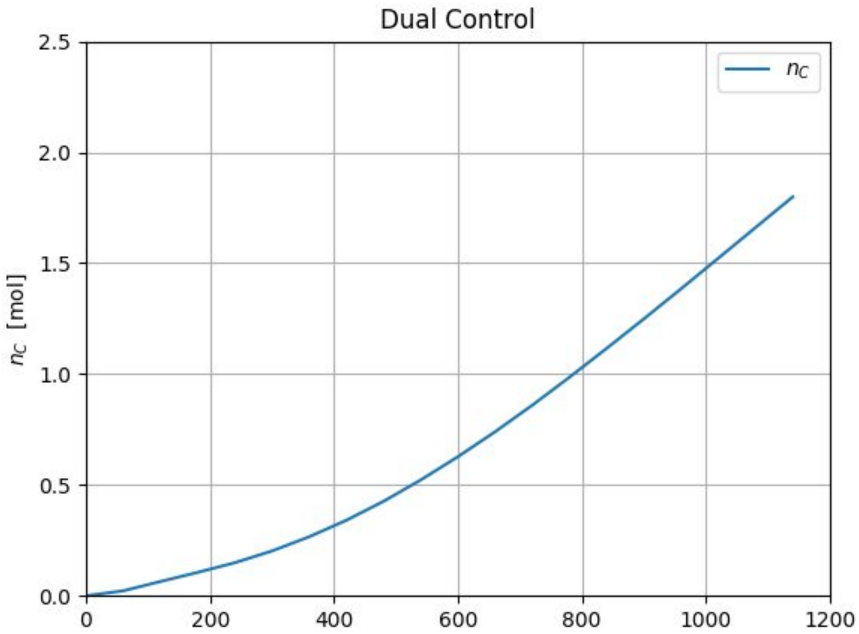
Trial 1

Qz = np.diag([10**-17, 5, 5, 5, .2, .2, .2, (3.0457*10**(-7))*discritize*4E-9, 323.05*.9E1])

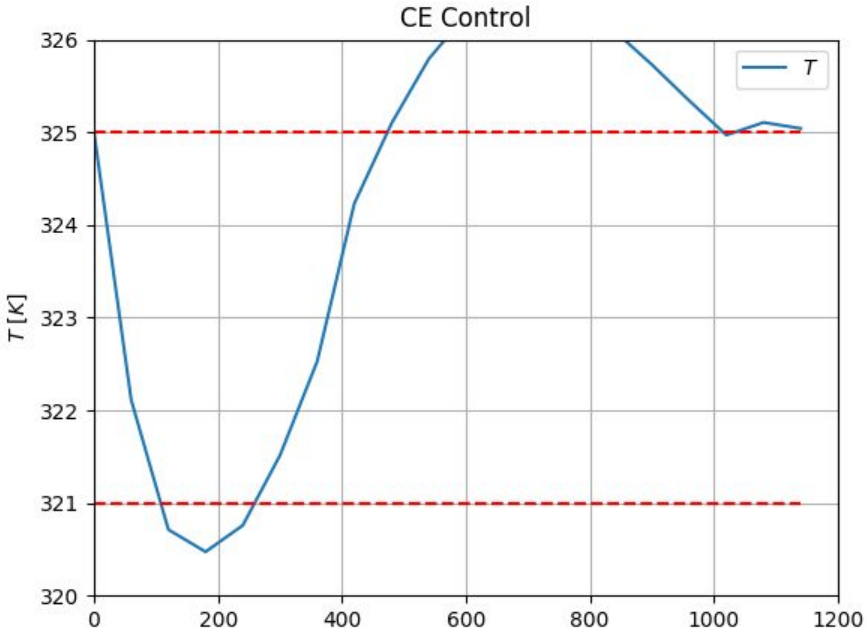
*Arbitrary tuning

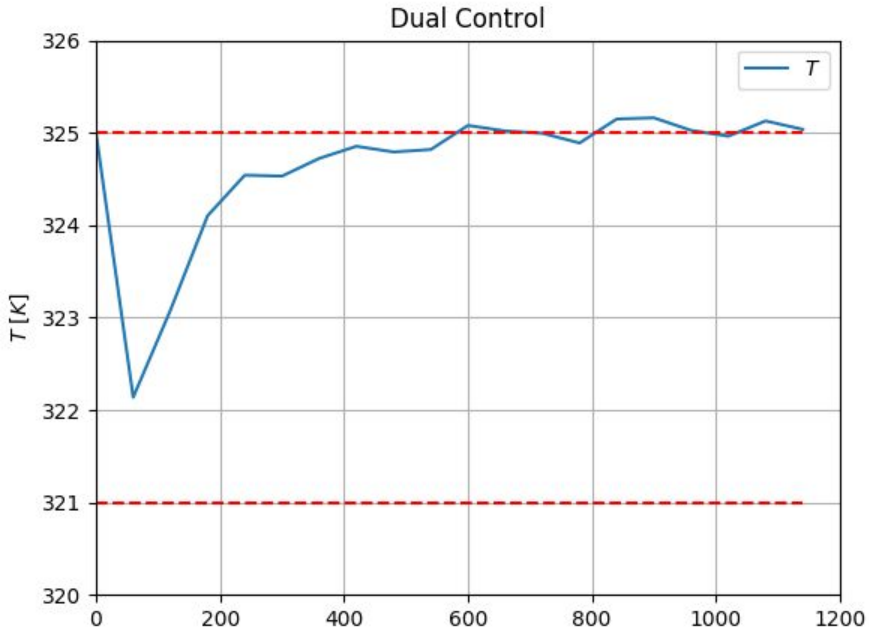
Objective function (maximize moles of C)



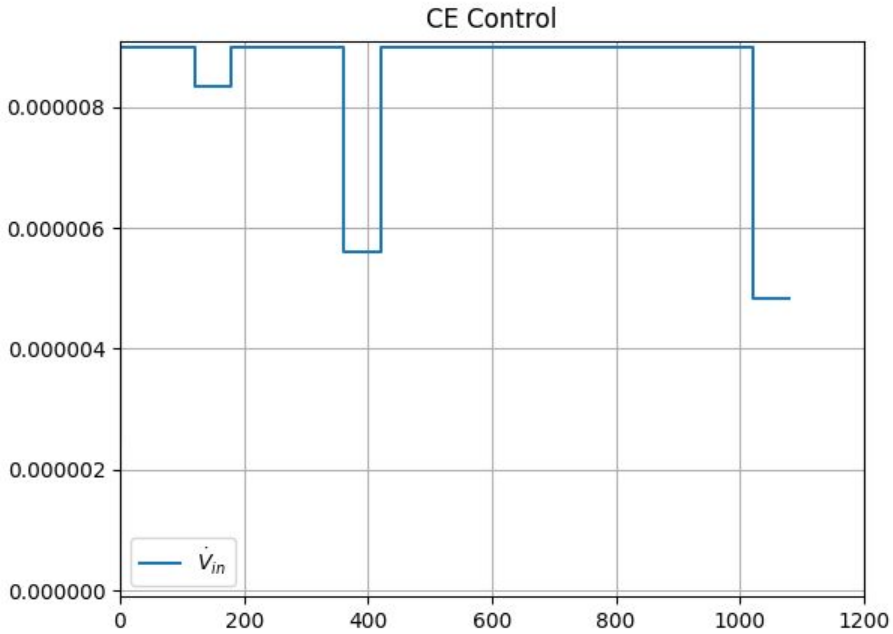


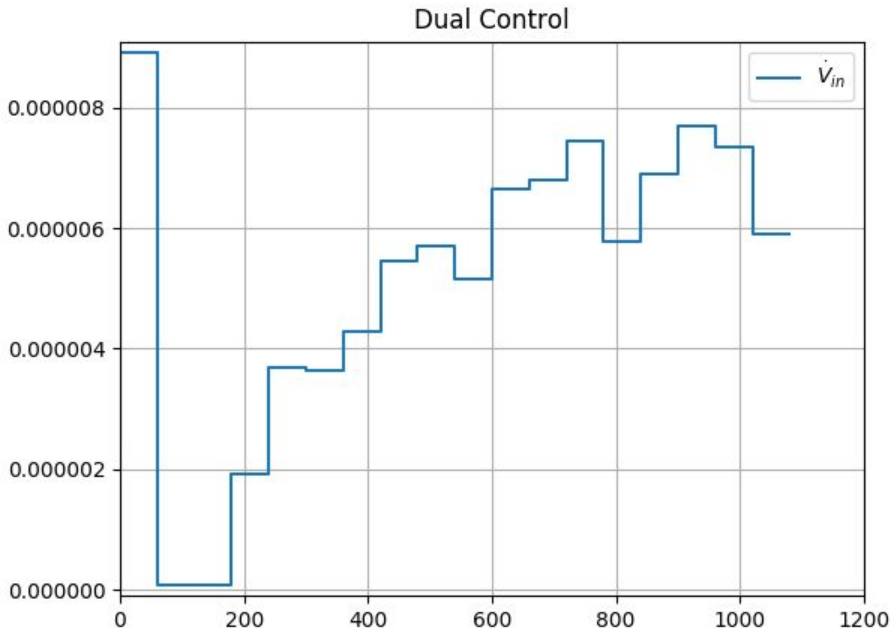
State 5


CE Control
T
T [K]
326
325
324
323
322
321
320
0
200
400
600
800
1000
1200

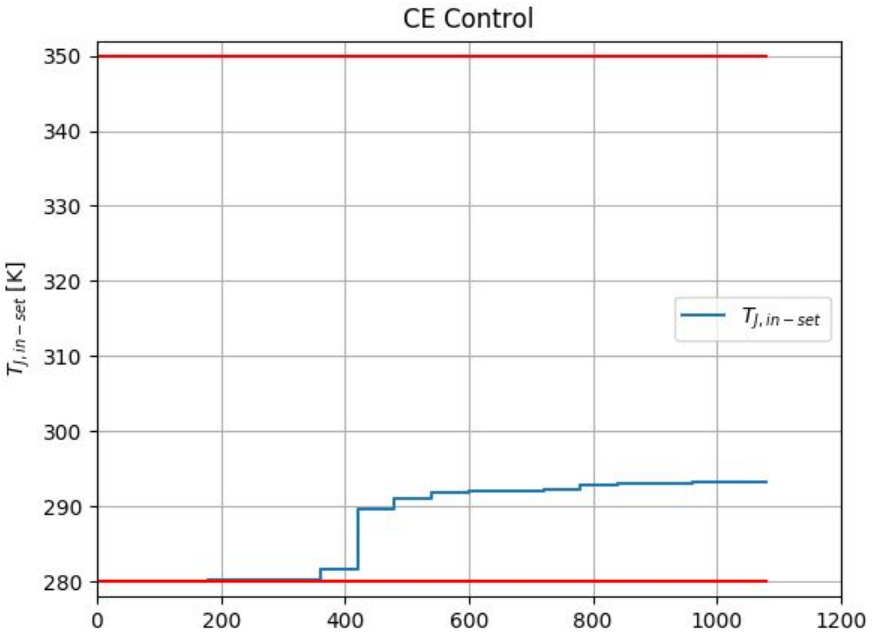

Dual Control
T
T [K]
326
325
324
323
322
321
320
0
200
400
600
800
1000
1200

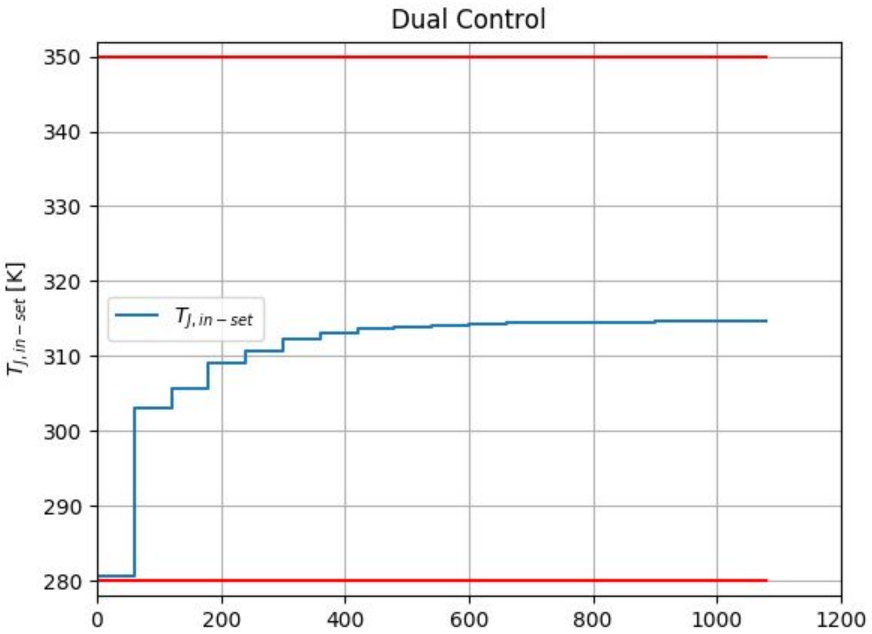
Input 1


CE Control
0.000008
0.000006
0.000004
0.000002
0.000000
0
200
400
600
800
1000
1200
$\dot{V}_{in}$


Dual Control
0.000008
0.000006
0.000004
0.000002
0.000000
0
200
400
600
800
1000
1200
$\dot{V}_{in}$

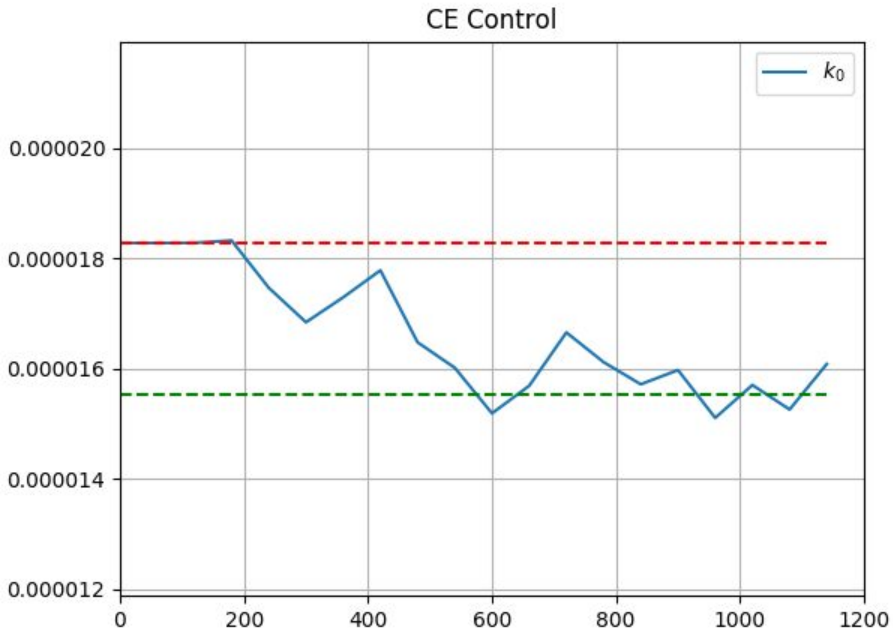
Input 2

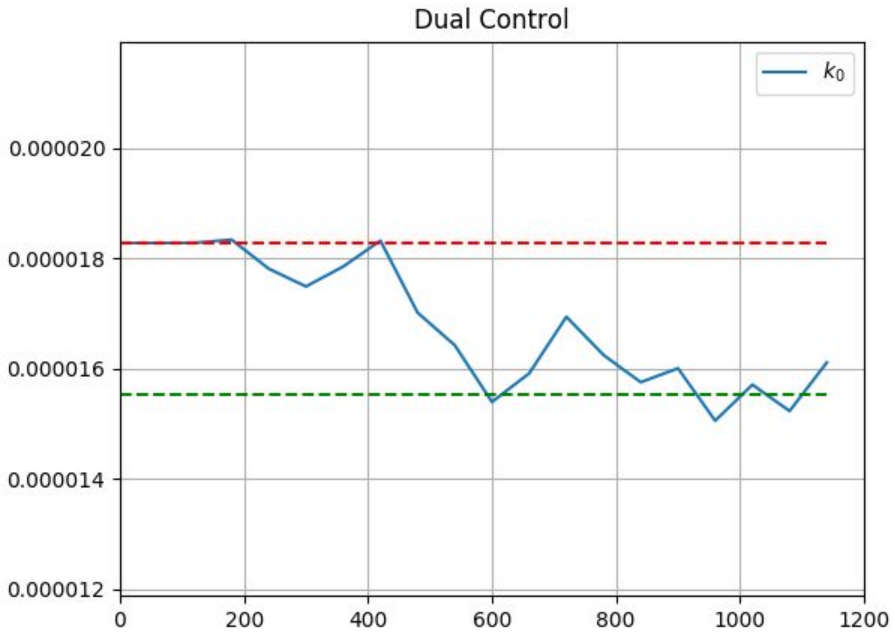

CE Control
$T_{J,in-set}$ [K]
$T_{J,in-set}$
350
340
330
320
310
300
290
280
0
200
400
600
800
1000
1200


Dual Control
$T_{J,in-set}$ [K]
$T_{J,in-set}$
350
340
330
320
310
300
290
280
0
200
400
600
800
1000
1200

Parameter estimate 1

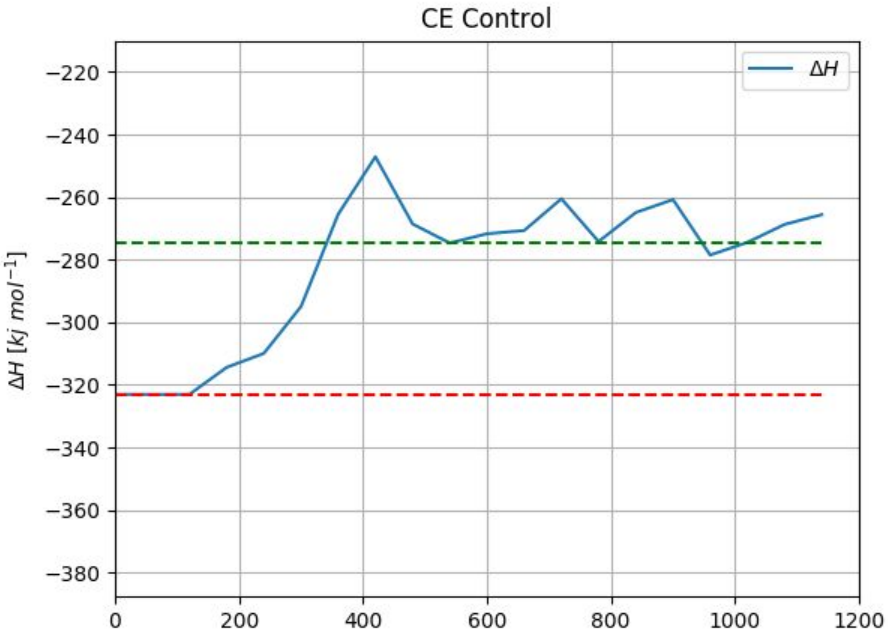
Red = theta nominal
Green = theta actual

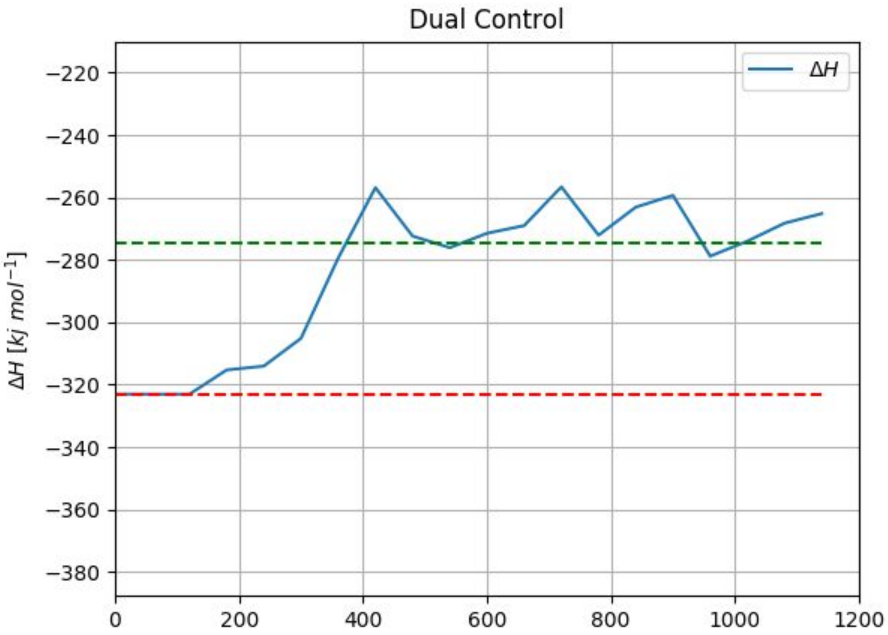




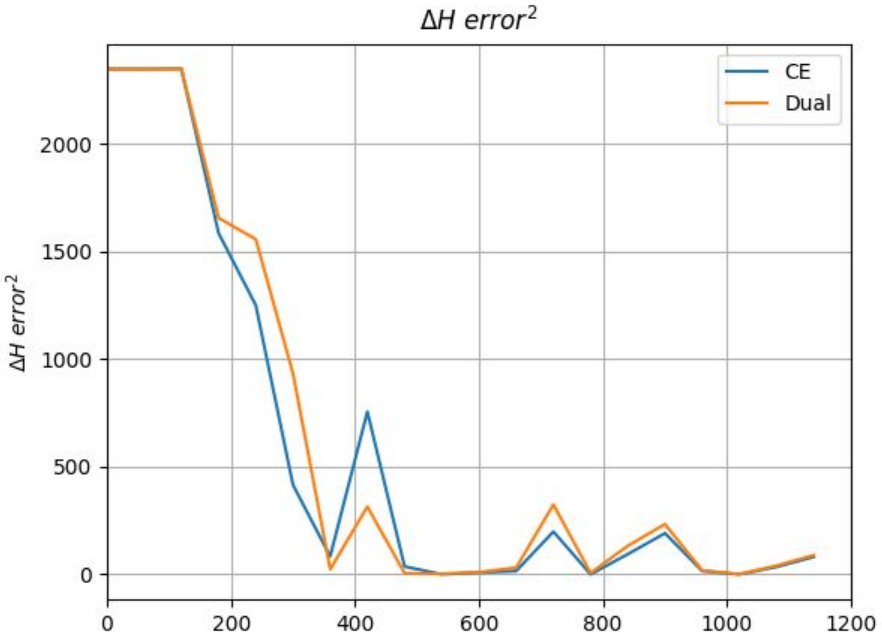
Parameter estimate 2

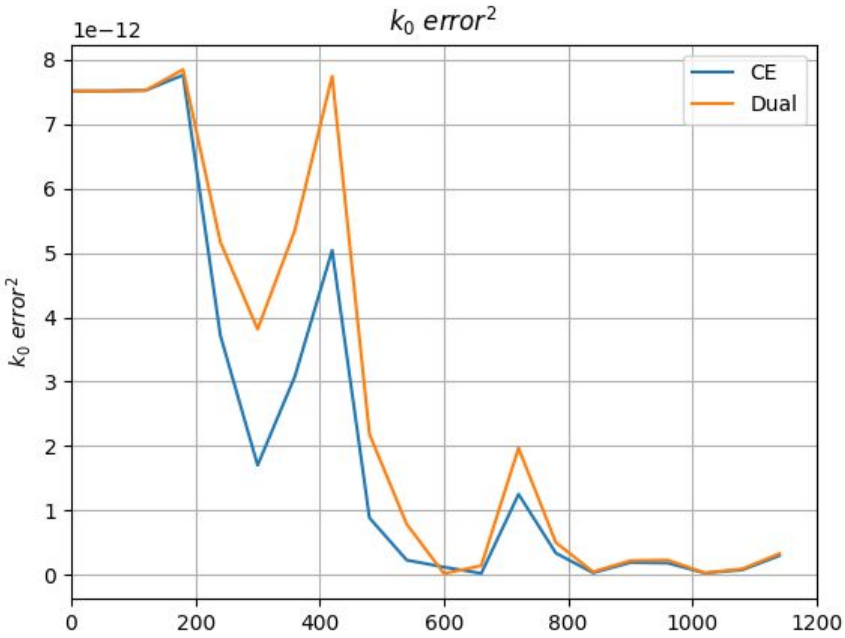
Red = theta nominal
Green = theta actual





Parameter estimate error



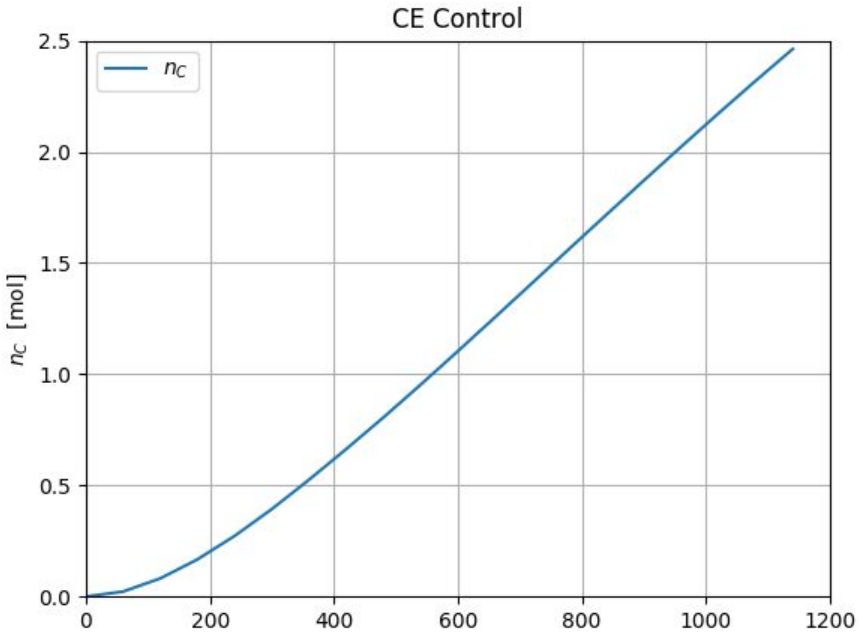


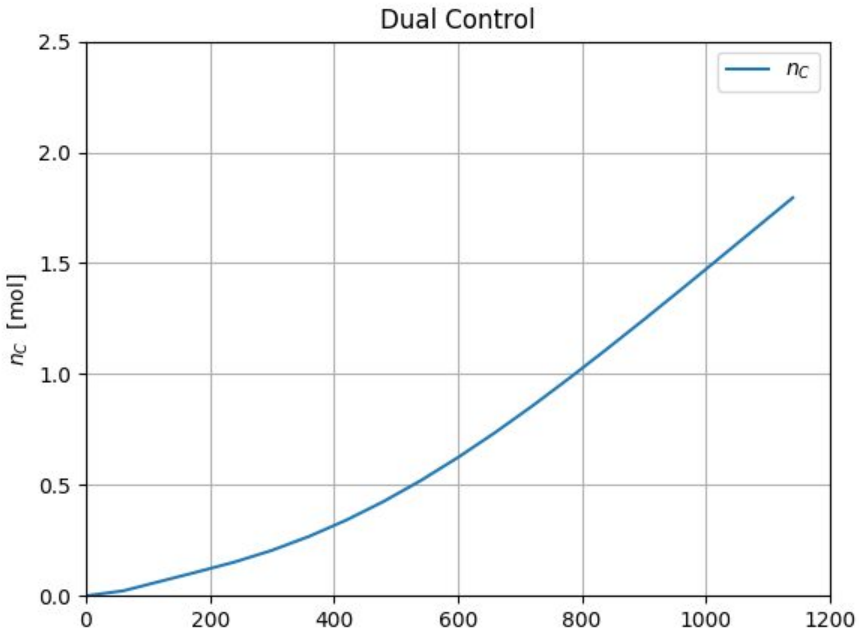
Trial 2

Qz = np.diag([10**-17, 5, 5, 5, .2, .2, .2, (3.0457*10**(-7))*discritize*4E-9, 323.05*.9E1])

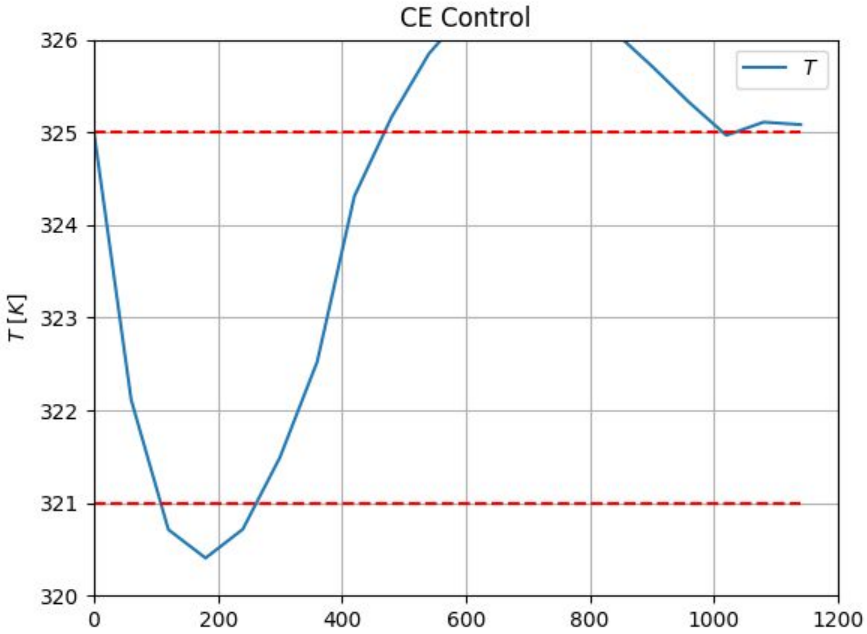
*Arbitrary tuning

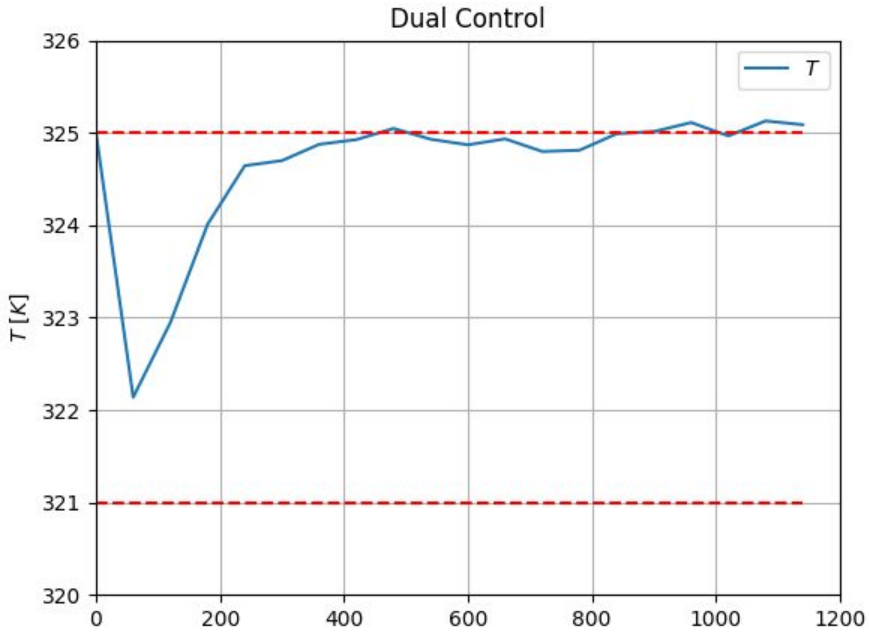
Objective function (maximize moles of C)



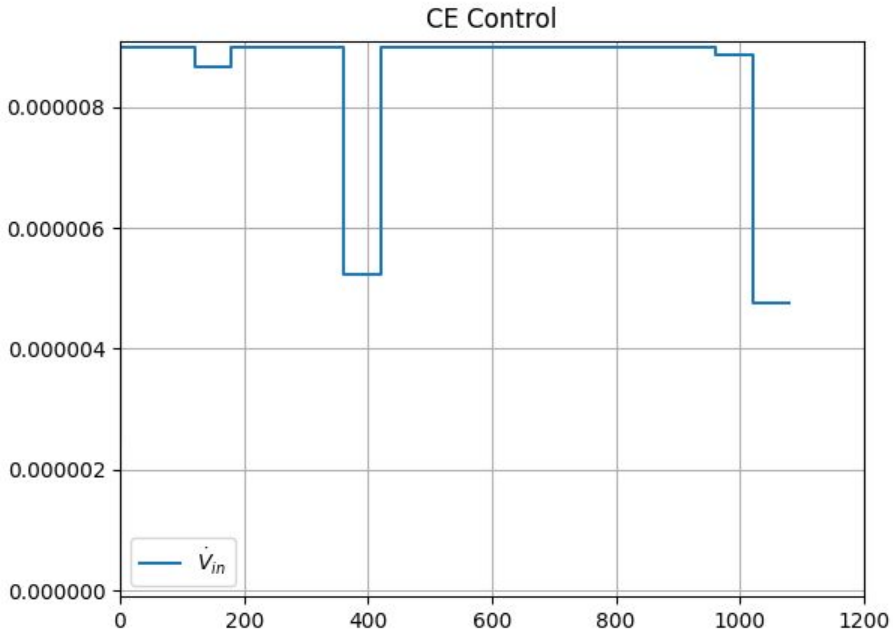


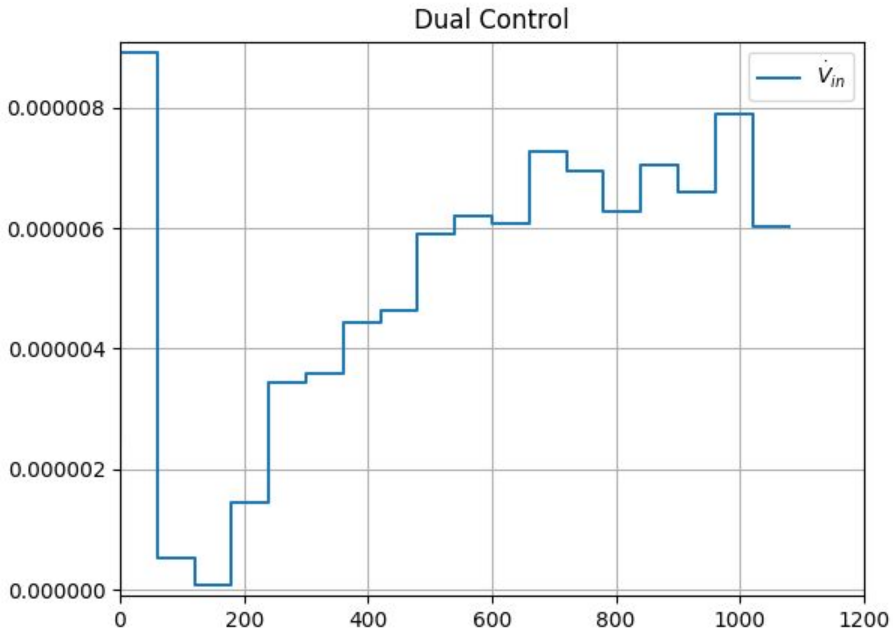
State 5


CE Control
T
T [K]
326
325
324
323
322
321
320
0
200
400
600
800
1000
1200

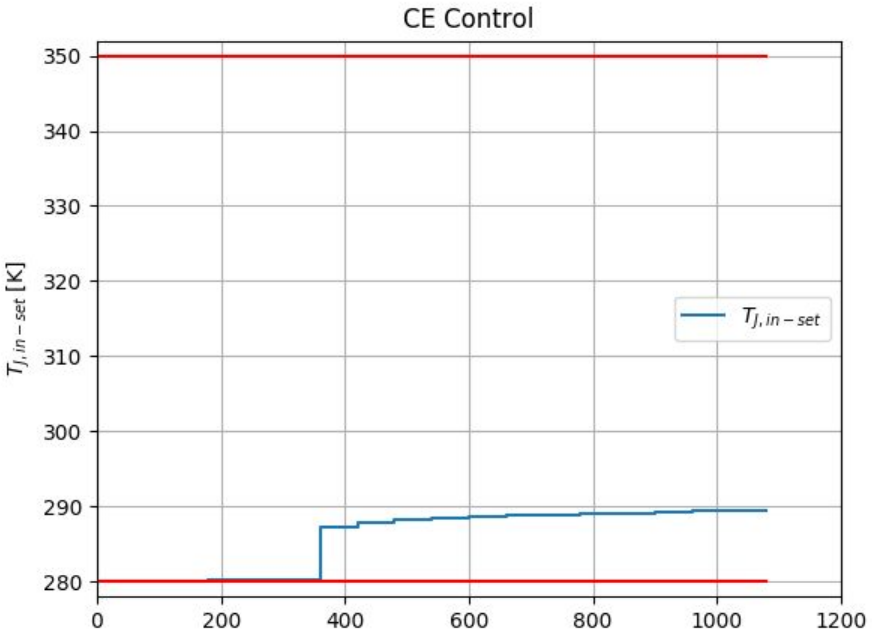

Dual Control
T
T [K]
326
325
324
323
322
321
320
0
200
400
600
800
1000
1200

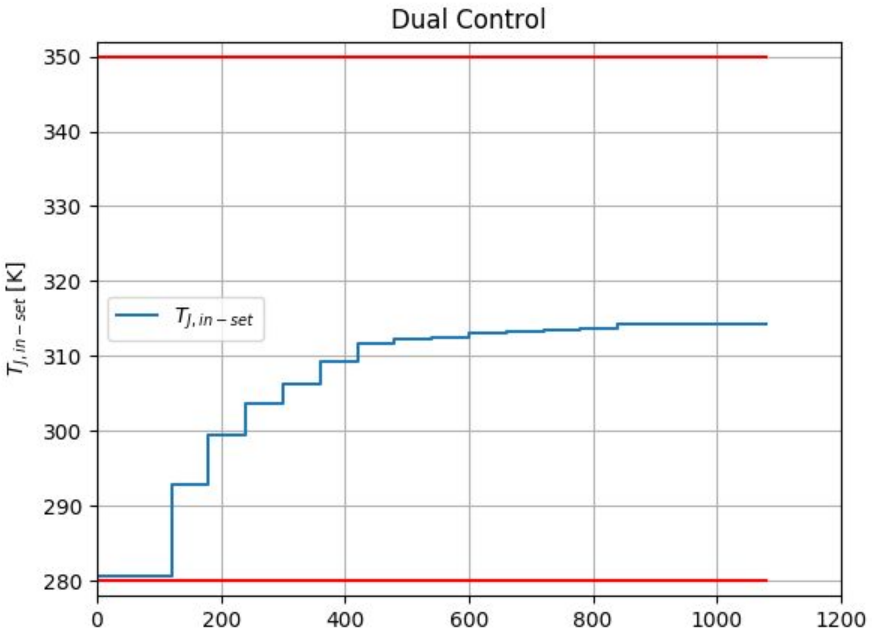
Input 1


CE Control
0.000008
0.000006
0.000004
0.000002
0.000000
0
200
400
600
800
1000
1200
$\dot{V}_{in}$


Dual Control
0.000008
0.000006
0.000004
0.000002
0.000000
0
200
400
600
800
1000
1200
$\dot{V}_{in}$

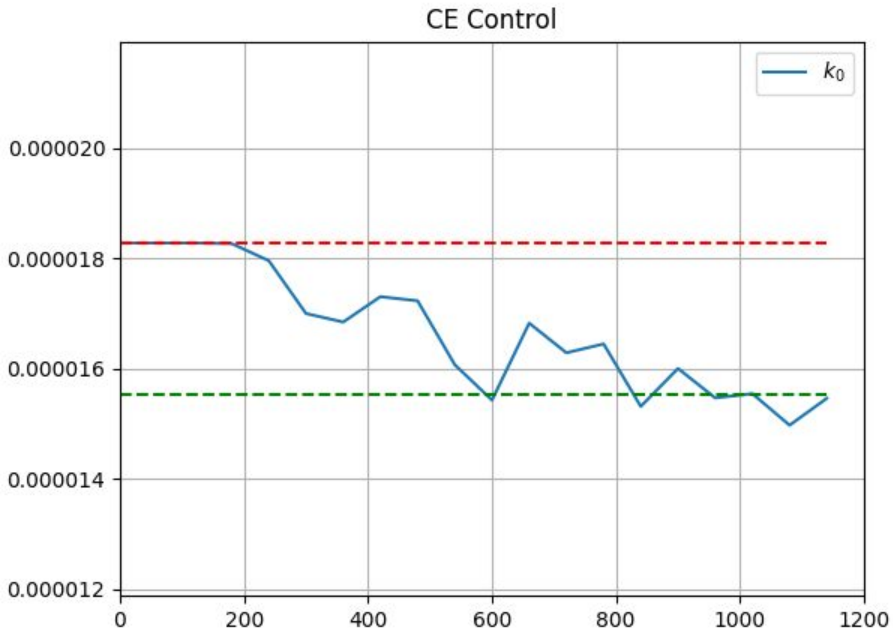
Input 2

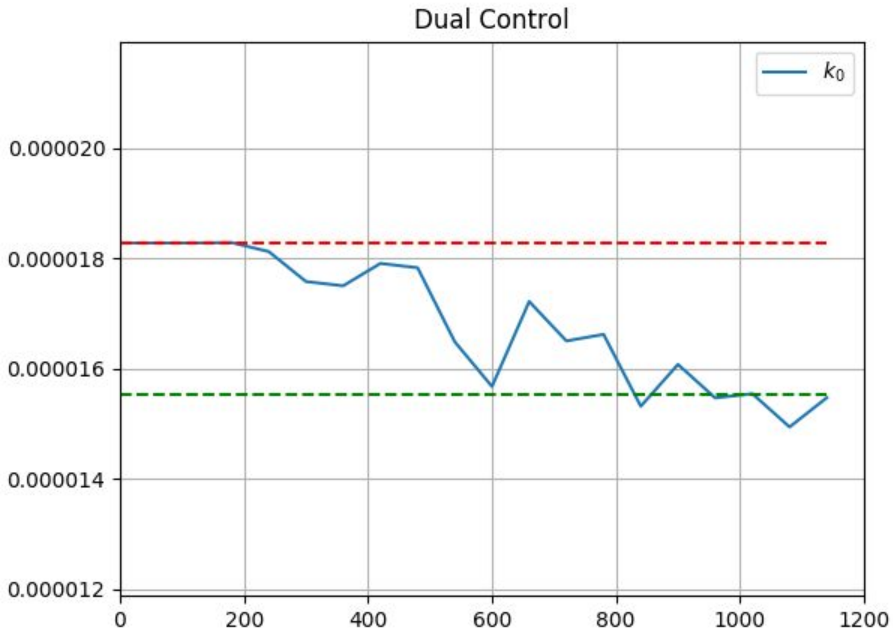

CE Control
$T_{J,in-set}$ [K]
$T_{J,in-set}$
350
340
330
320
310
300
290
280
0
200
400
600
800
1000
1200


Dual Control
$T_{J,in-set}$ [K]
$T_{J,in-set}$
350
340
330
320
310
300
290
280
0
200
400
600
800
1000
1200

Parameter estimate 1

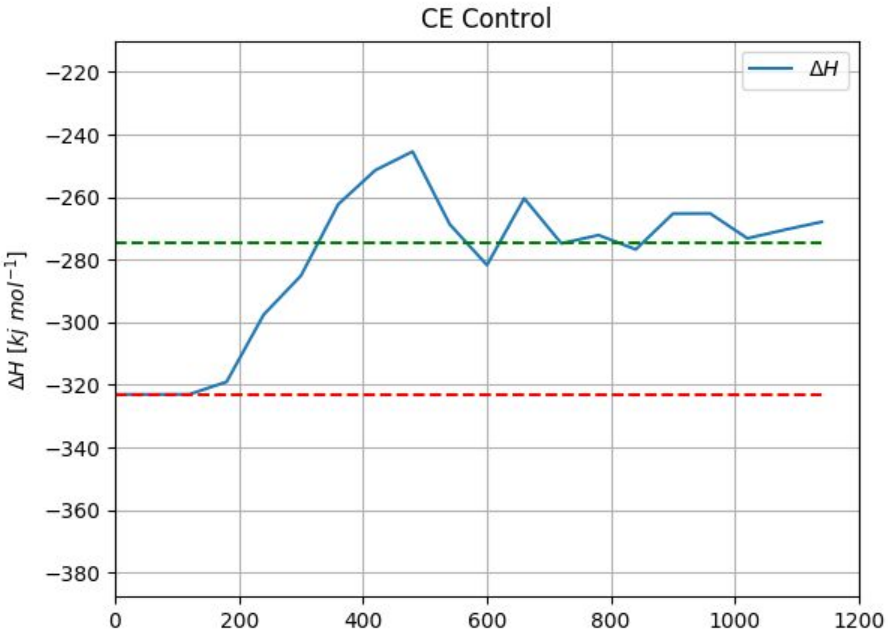
Red = theta nominal
Green = theta actual

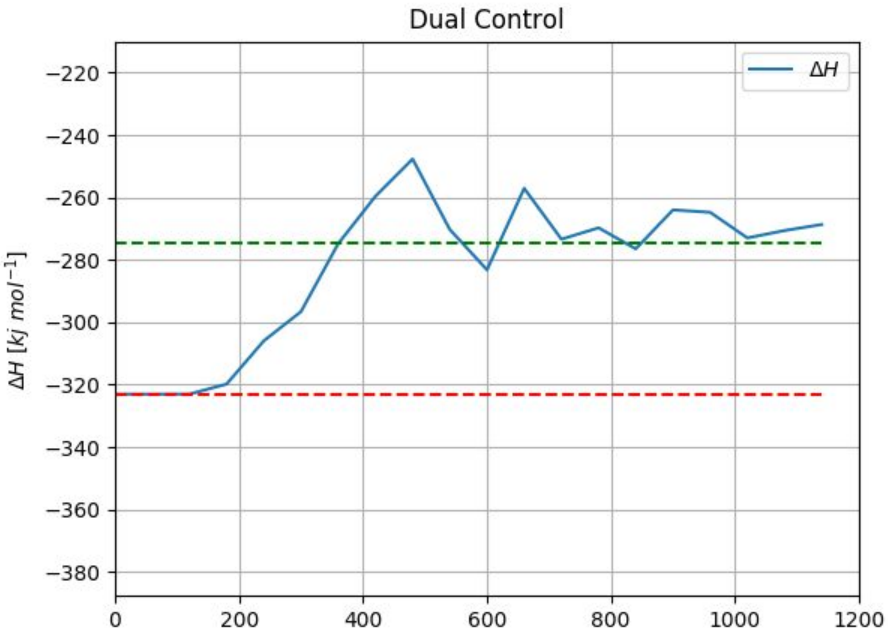




Parameter estimate 2

Red = theta nominal
Green = theta actual





Parameter estimate error