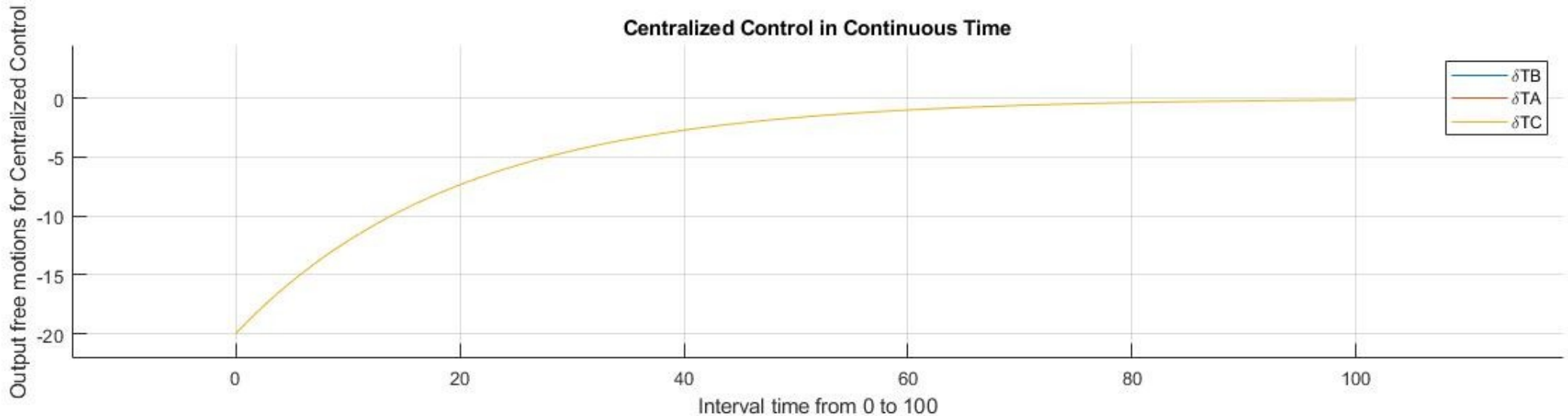
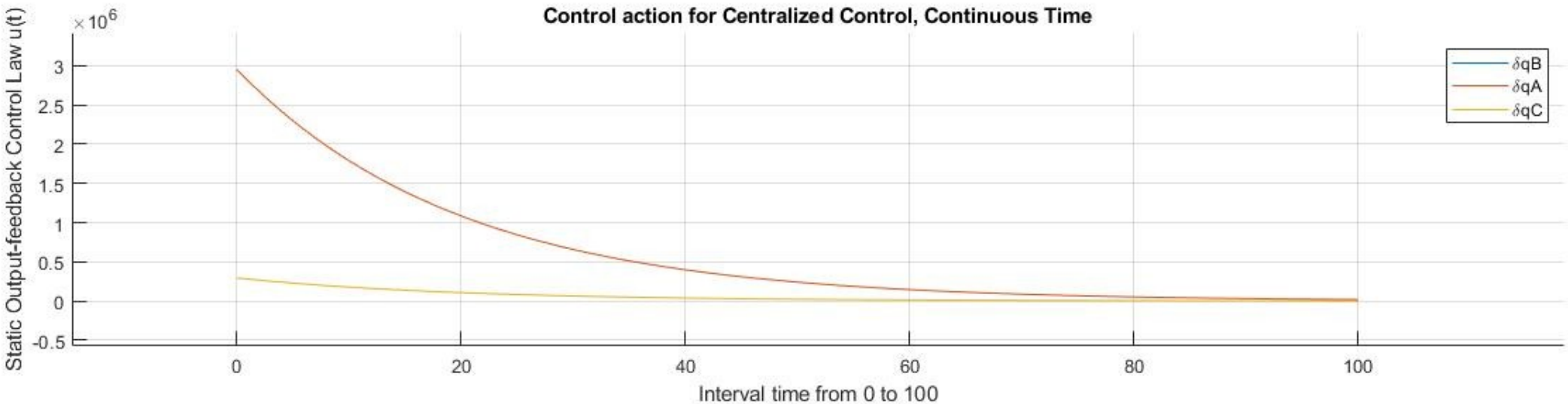
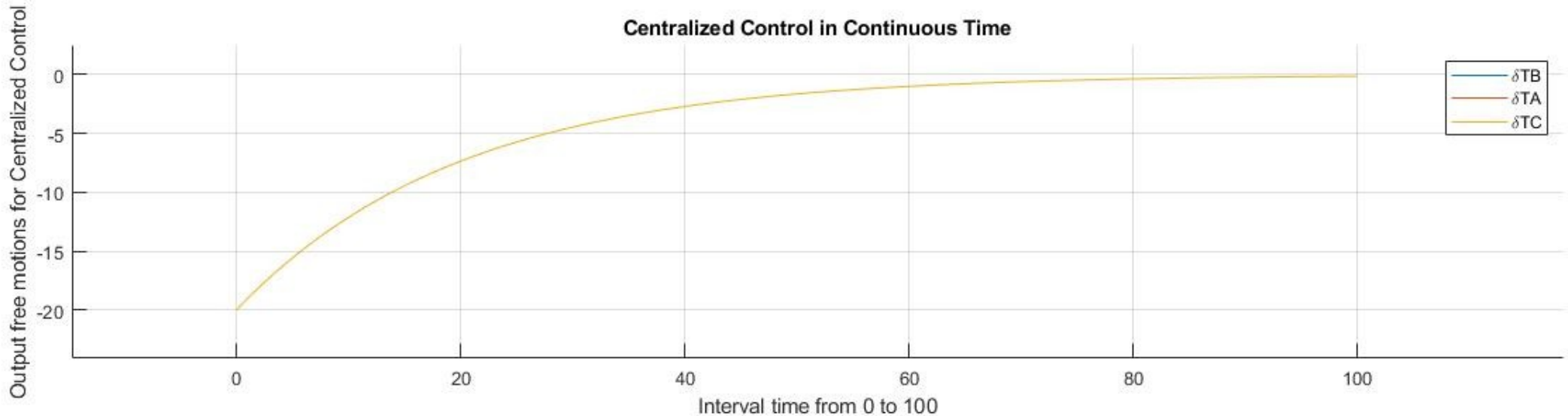
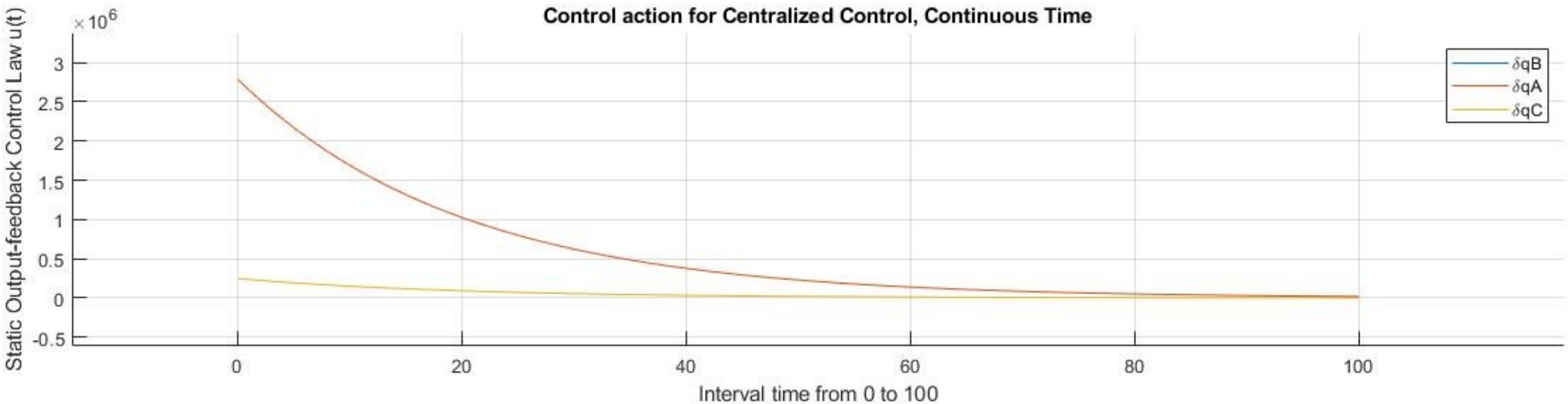
u = 2 U = 0.5


Centralized Control in Continuous Time
Output free motions for Centralized Control
0
-5
-10
-15
-20
0
20
40
60
80
100
Interval time from 0 to 100
δTB
δTA
δTC

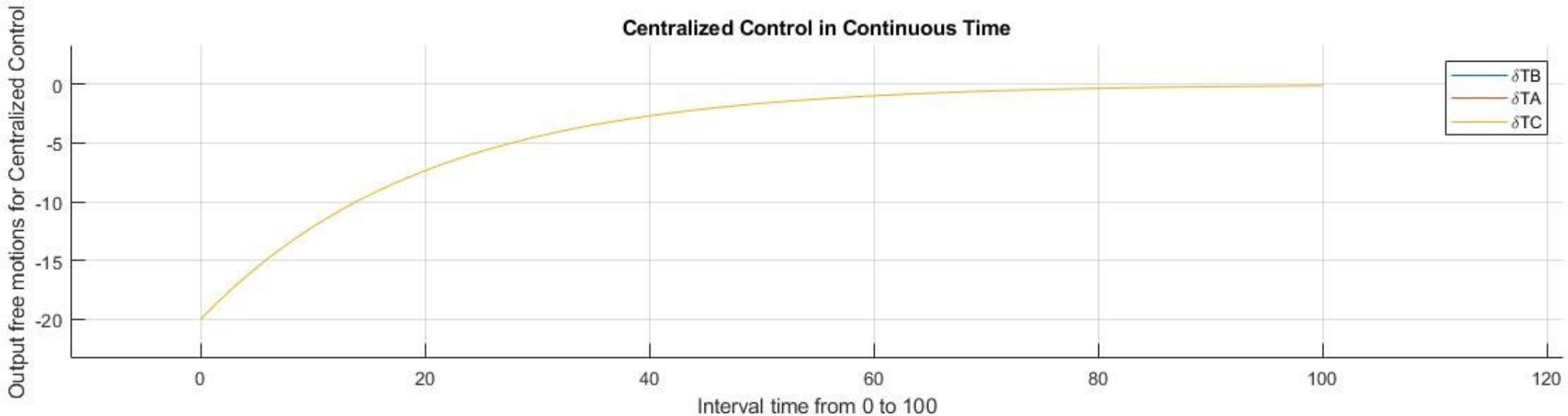

Control action for Centralized Control, Continuous Time
Static Output-feedback Control Law u(t)
×10^6
3
2.5
2
1.5
1
0.5
0
-0.5
0
20
40
60
80
100
Interval time from 0 to 100
δqB
δqA
δqC

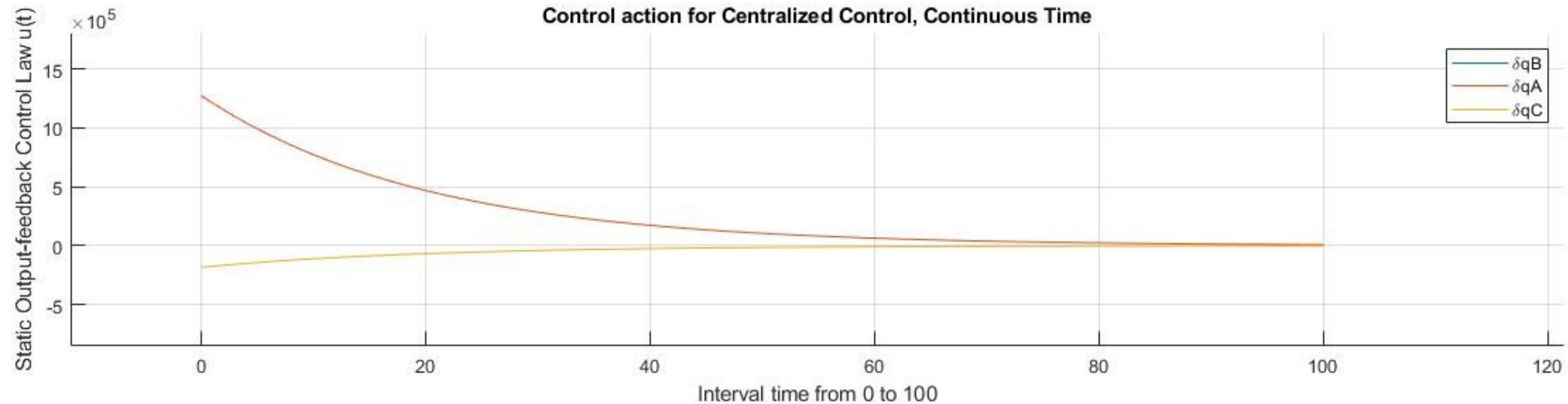
u = 100 U = 100


Centralized Control in Continuous Time
Output free motions for Centralized Control
0
-5
-10
-15
-20
0
20
40
60
80
100
Interval time from 0 to 100
δTB
δTA
δTC

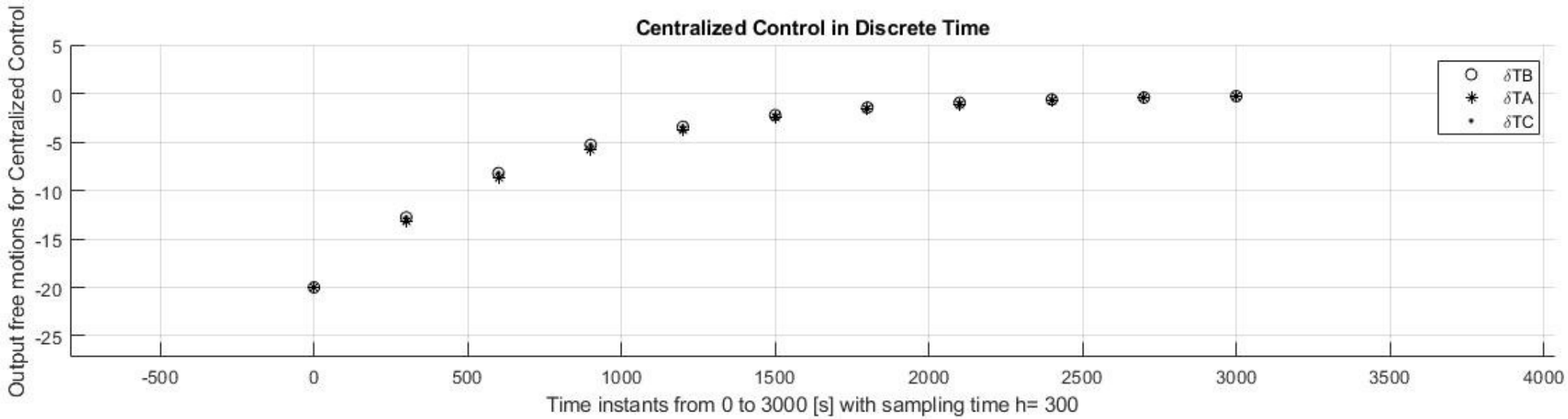

Control action for Centralized Control, Continuous Time
Static Output-feedback Control Law u(t)
×10^6
3
2.5
2
1.5
1
0.5
0
-0.5
0
20
40
60
80
100
Interval time from 0 to 100
δqB
δqA
δqC

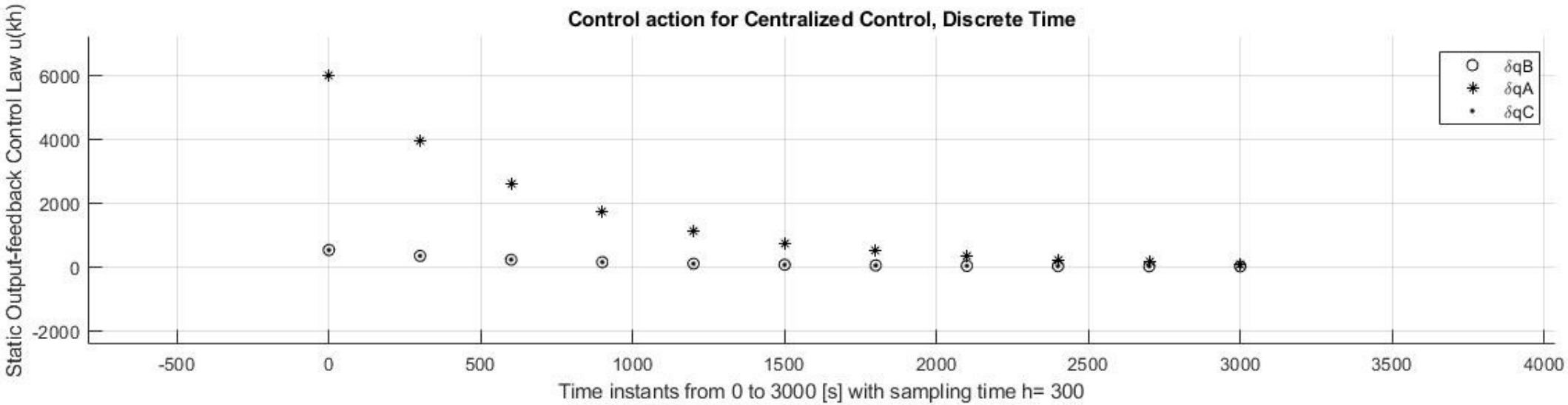
u = 1000 U = 1000


Centralized Control in Continuous Time
Output free motions for Centralized Control
0
-5
-10
-15
-20
0
20
40
60
80
100
120
Interval time from 0 to 100
δTB
δTA
δTC

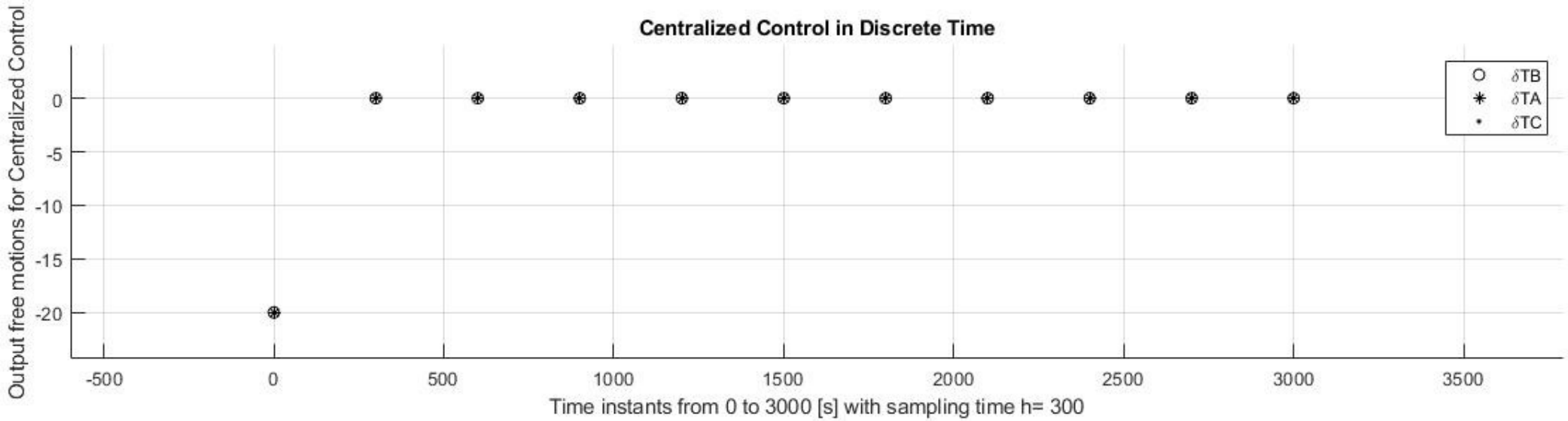

Control action for Centralized Control, Continuous Time
Static Output-feedback Control Law u(t)
×10^5
15
10
5
0
-5
0
20
40
60
80
100
120
Interval time from 0 to 100
δqB
δqA
δqC

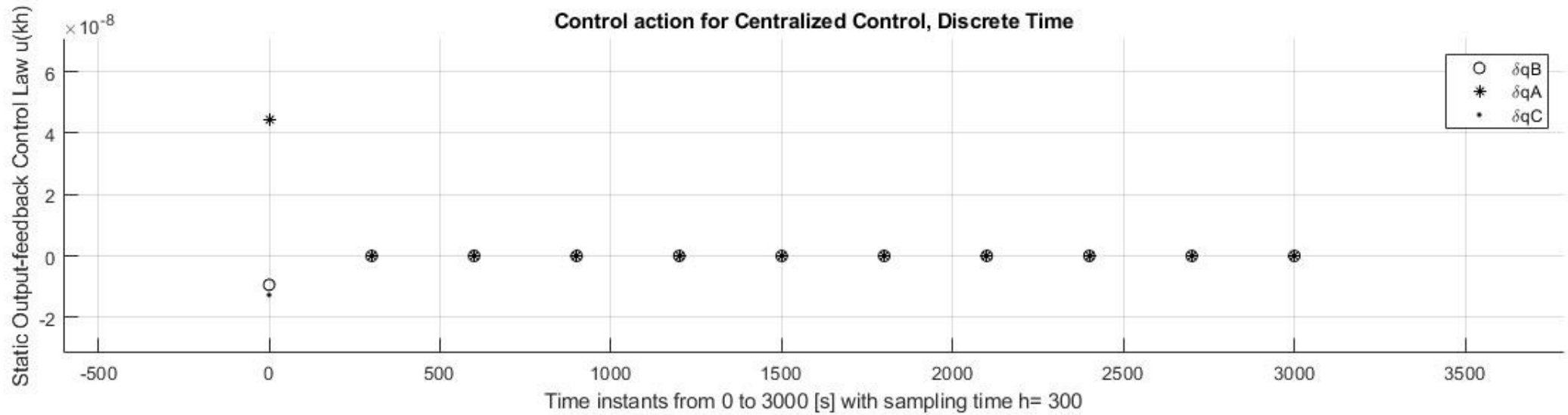
u = 2 U = 0.5


Centralized Control in Discrete Time
Output free motions for Centralized Control
5
0
-5
-10
-15
-20
-25
-500
0
500
1000
1500
2000
2500
3000
3500
4000
Time instants from 0 to 3000 [s] with sampling time h= 300
δTB
δTA
δTC

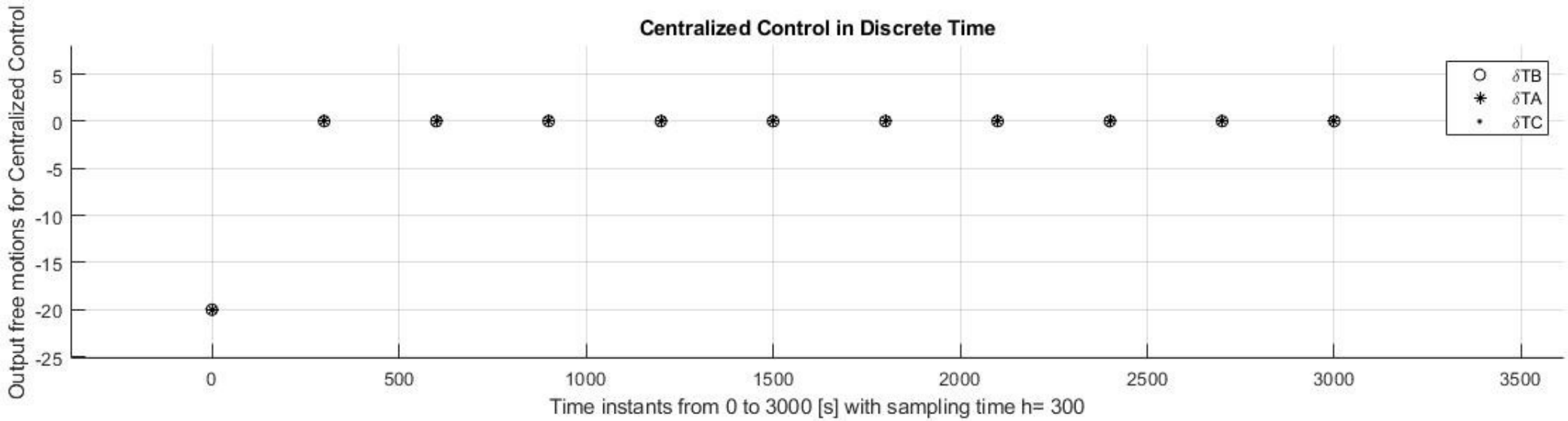

Control action for Centralized Control, Discrete Time
Static Output-feedback Control Law u(kh)
6000
4000
2000
0
-2000
-500
0
500
1000
1500
2000
2500
3000
3500
4000
Time instants from 0 to 3000 [s] with sampling time h= 300
δqB
δqA
δqC

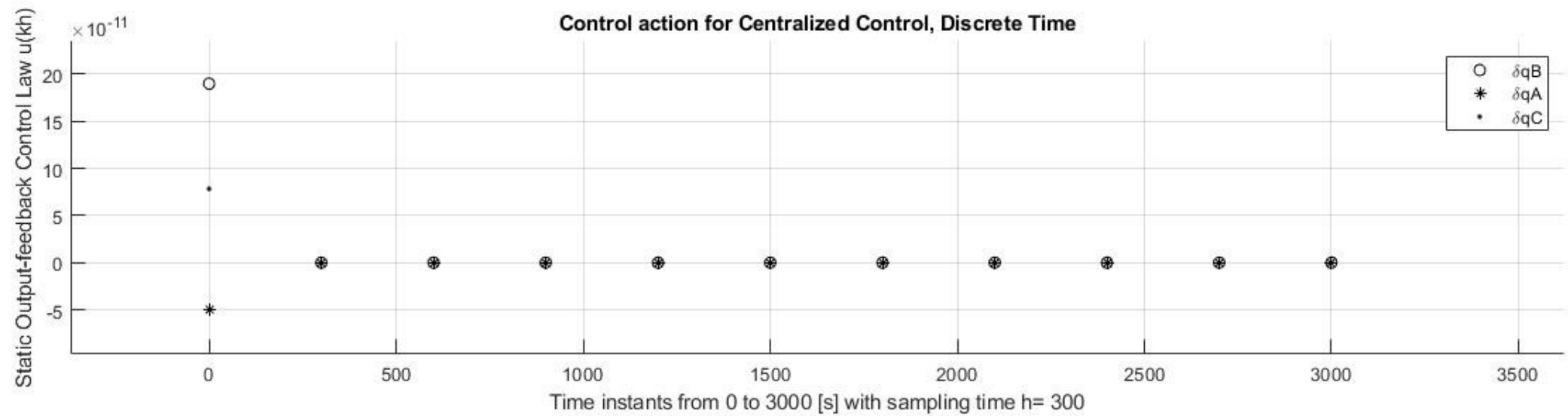
u = 100 U = 100


Centralized Control in Discrete Time
Output free motions for Centralized Control
0
-5
-10
-15
-20
-500
0
500
1000
1500
2000
2500
3000
3500
Time instants from 0 to 3000 [s] with sampling time h= 300
δTB
δTA
δTC

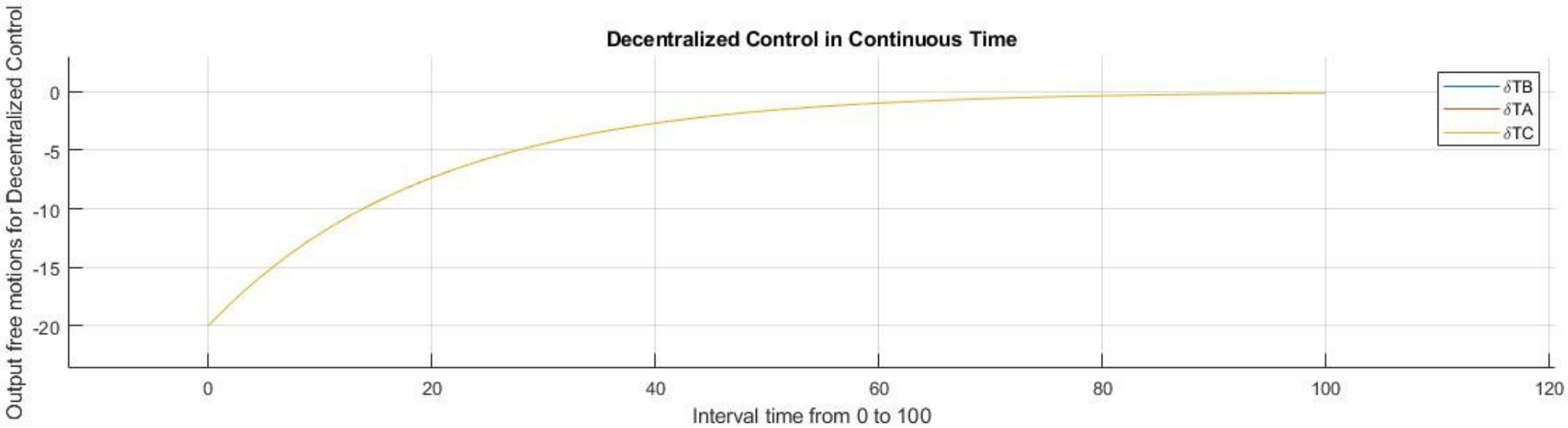

Control action for Centralized Control, Discrete Time
×10^-8
Static Output-feedback Control Law u(kh)
6
4
2
0
-2
-500
0
500
1000
1500
2000
2500
3000
3500
Time instants from 0 to 3000 [s] with sampling time h= 300
δqB
δqA
δqC

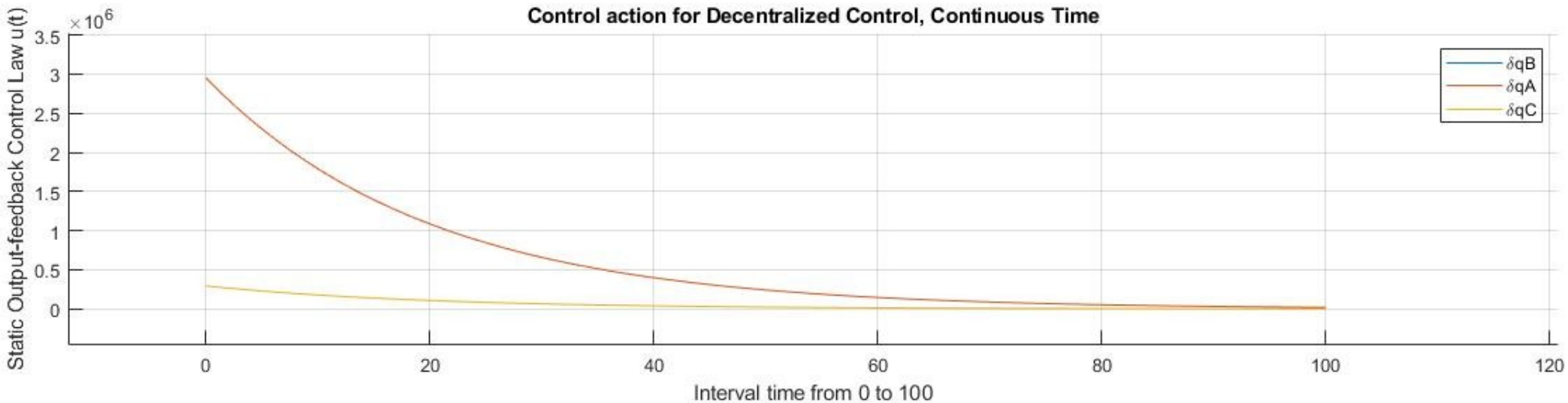
u = 1000 U = 1000


Centralized Control in Discrete Time
Output free motions for Centralized Control
5
0
-5
-10
-15
-20
-25
0
500
1000
1500
2000
2500
3000
3500
Time instants from 0 to 3000 [s] with sampling time h= 300
δTB
δTA
δTC

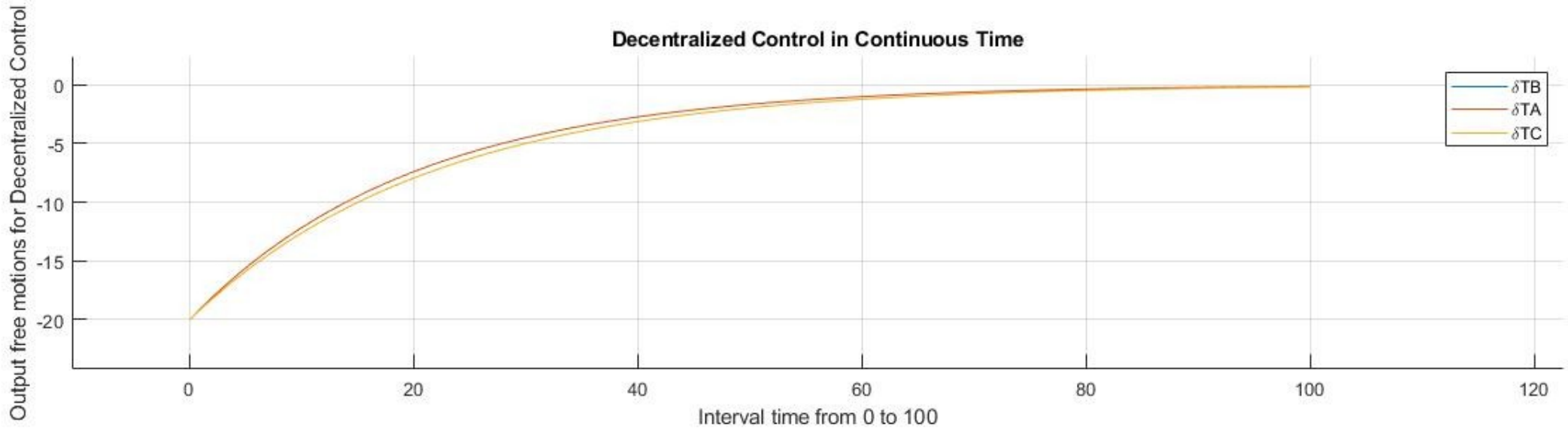

Control action for Centralized Control, Discrete Time
Static Output-feedback Control Law u(kh)
×10^-11
20
15
10
5
0
-5
0
500
1000
1500
2000
2500
3000
3500
Time instants from 0 to 3000 [s] with sampling time h= 300
δqB
δqA
δqC

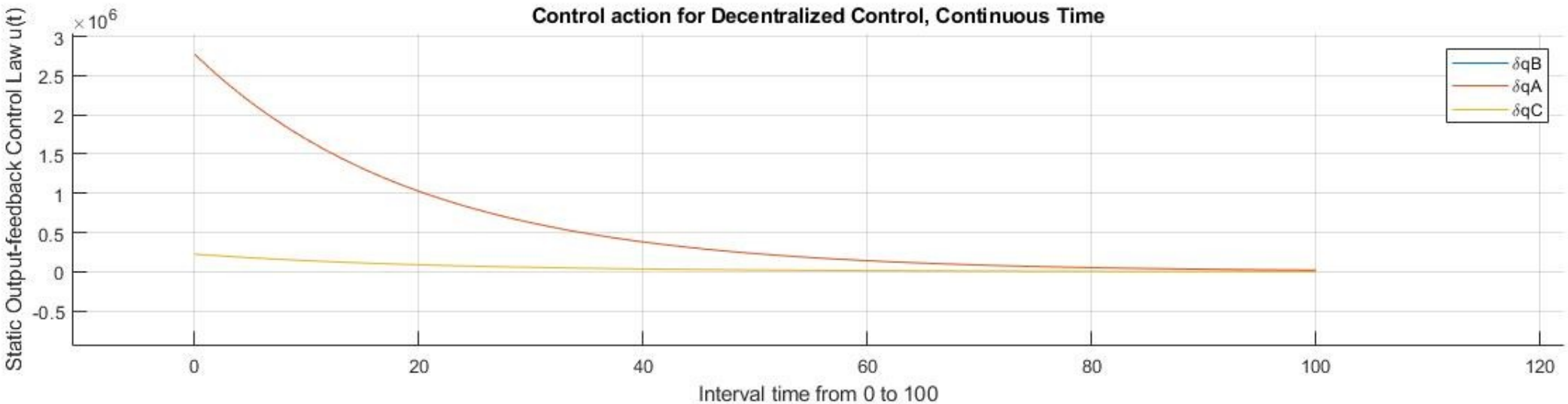
u = 2 U = 0.5


Decentralized Control in Continuous Time
Output free motions for Decentralized Control
0
-5
-10
-15
-20
0
20
40
60
80
100
120
Interval time from 0 to 100
δTB
δTA
δTC

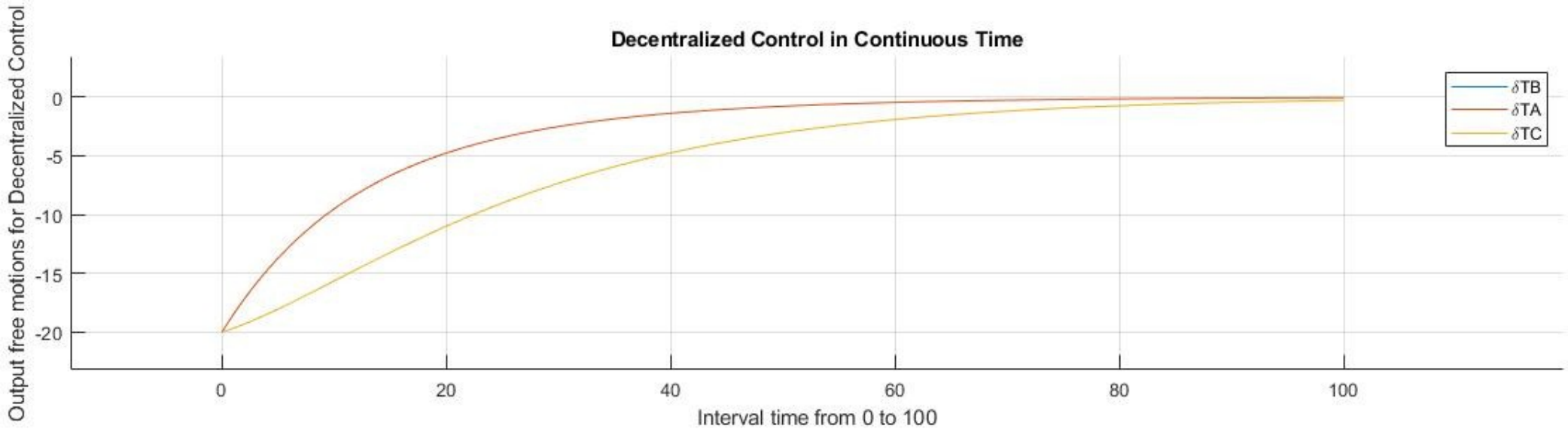

Control action for Decentralized Control, Continuous Time
Static Output-feedback Control Law u(t)
×10^6
3.5
3
2.5
2
1.5
1
0.5
0
0
20
40
60
80
100
120
Interval time from 0 to 100
δqB
δqA
δqC

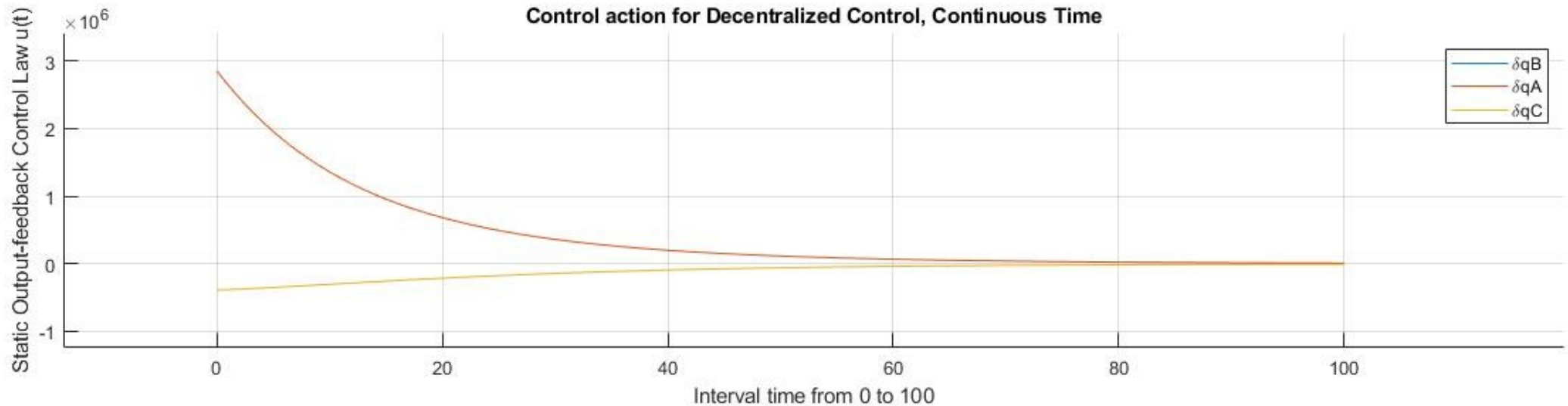
u = 100 U = 100


Decentralized Control in Continuous Time
Output free motions for Decentralized Control
0
-5
-10
-15
-20
0
20
40
60
80
100
120
Interval time from 0 to 100
δTB
δTA
δTC

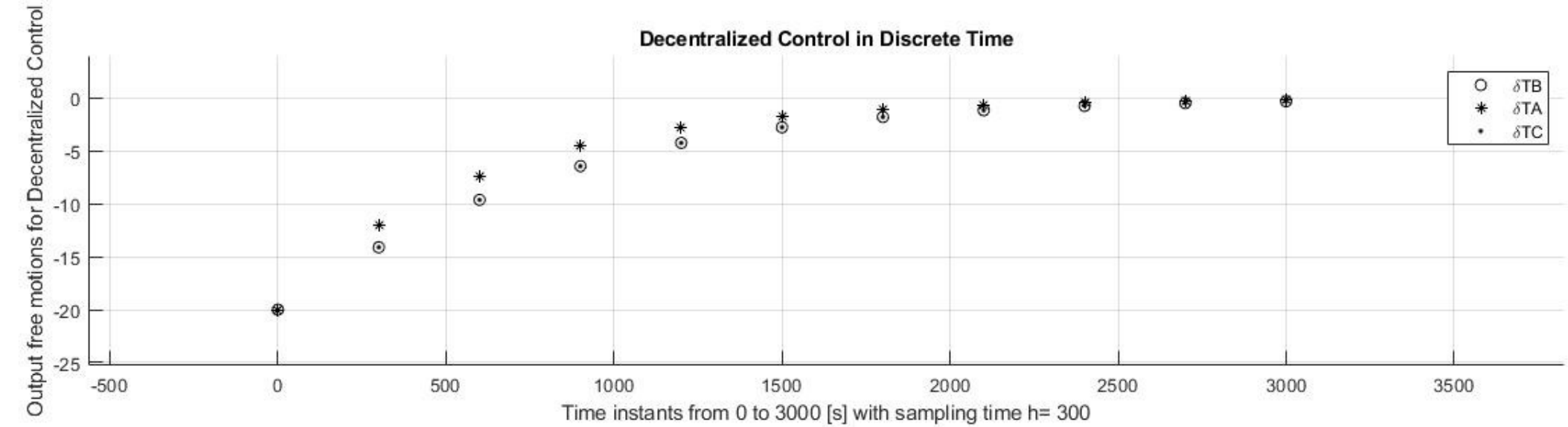

Control action for Decentralized Control, Continuous Time
Static Output-feedback Control Law u(t)
×10^6
3
2.5
2
1.5
1
0.5
0
-0.5
0
20
40
60
80
100
120
Interval time from 0 to 100
δqB
δqA
δqC

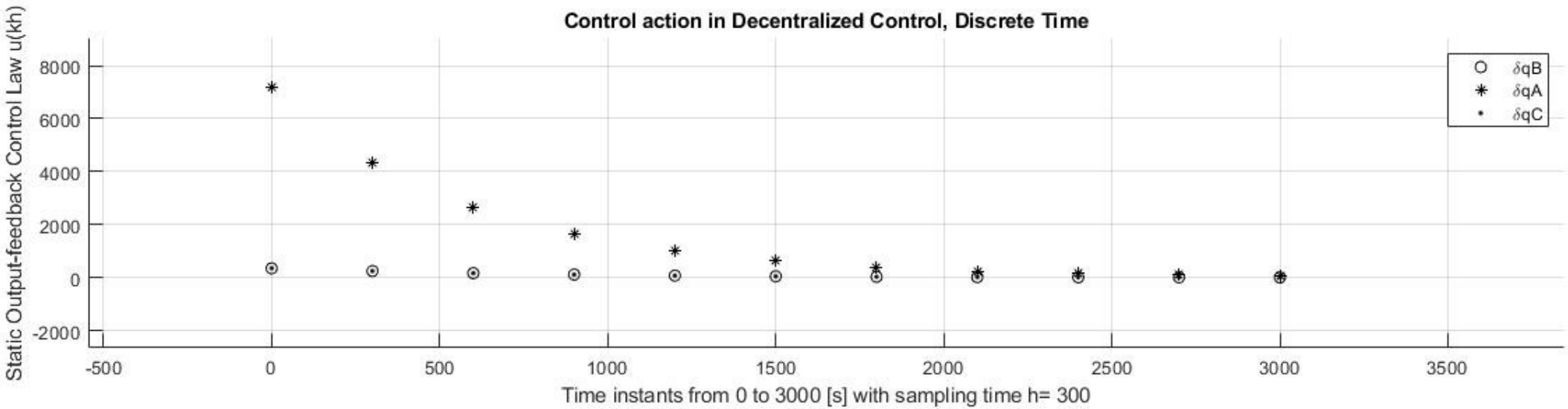
u = 1000 U = 1000


Decentralized Control in Continuous Time
Output free motions for Decentralized Control
0
-5
-10
-15
-20
0
20
40
60
80
100
Interval time from 0 to 100
δTB
δTA
δTC

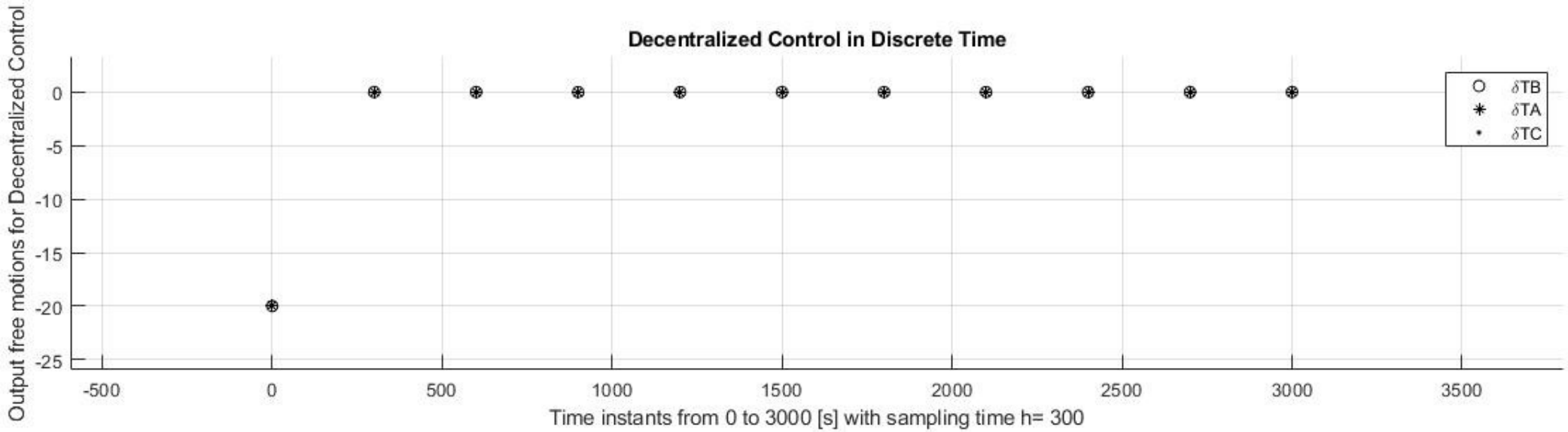

Control action for Decentralized Control, Continuous Time
Static Output-feedback Control Law u(t)
×10^6
3
2
1
0
-1
0
20
40
60
80
100
Interval time from 0 to 100
δqB
δqA
δqC

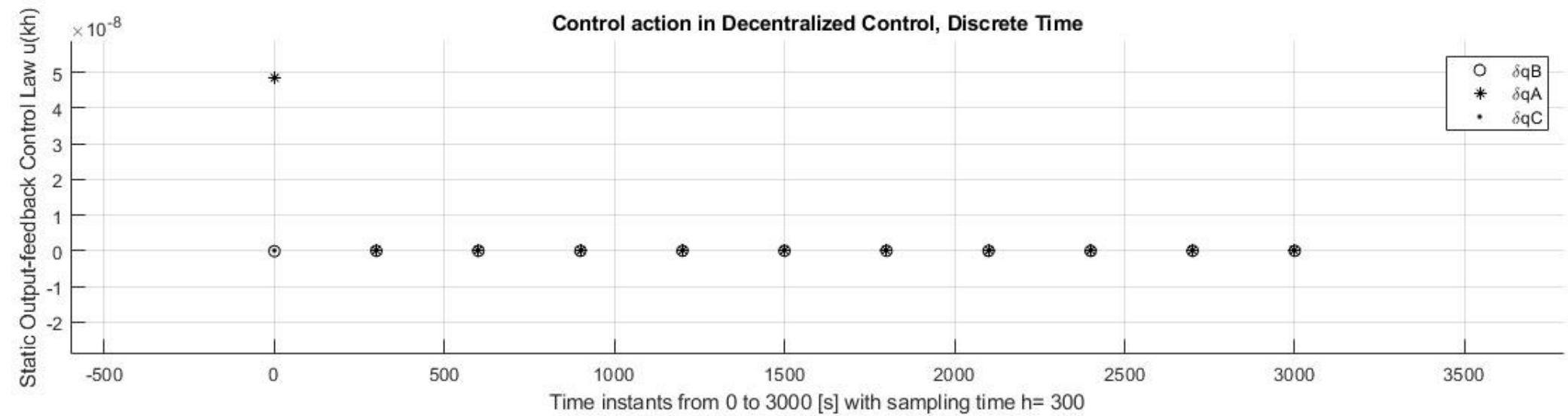
u = 2 U = 0.5


Decentralized Control in Discrete Time
Output free motions for Decentralized Control
Time instants from 0 to 3000 [s] with sampling time h= 300
δTB
δTA
δTC

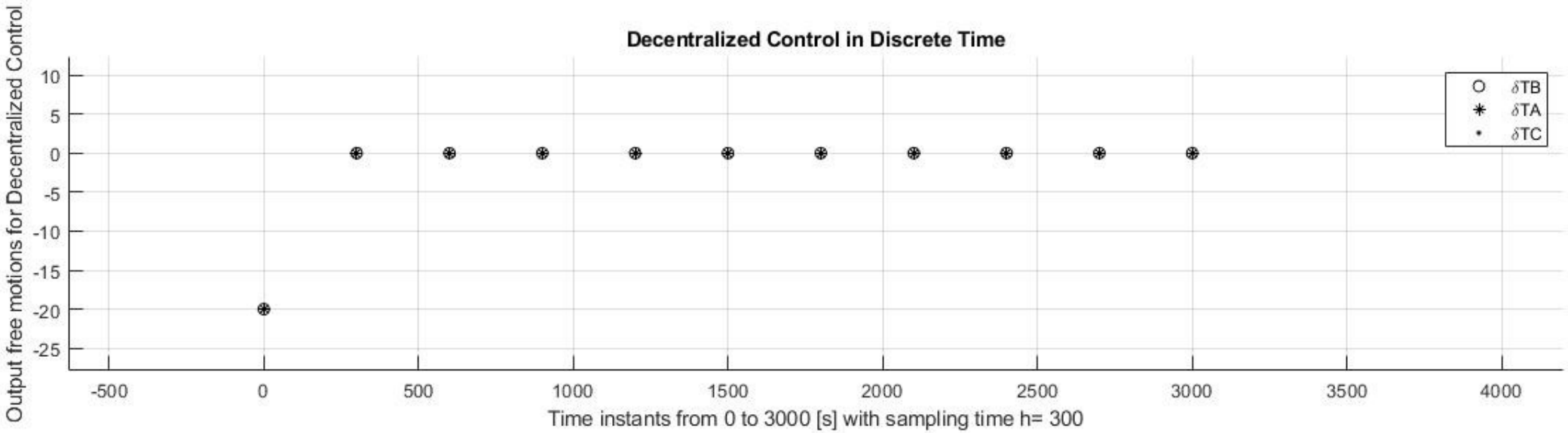

Control action in Decentralized Control, Discrete Time
Static Output-feedback Control Law u(kh)
Time instants from 0 to 3000 [s] with sampling time h= 300
δqB
δqA
δqC

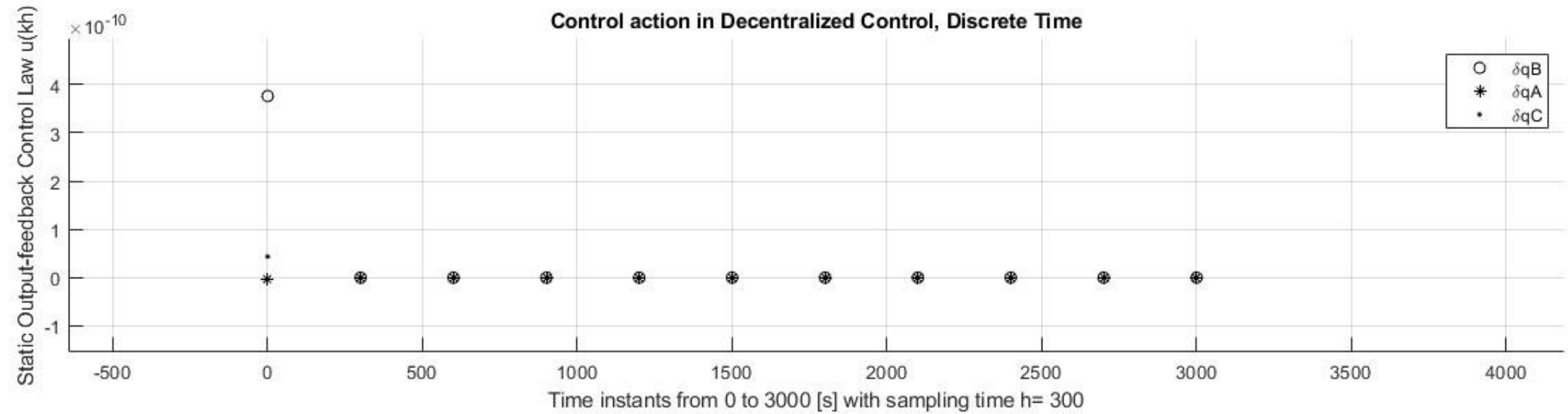
u = 100 U = 100


Decentralized Control in Discrete Time
Output free motions for Decentralized Control
0
-5
-10
-15
-20
-25
-500
0
500
1000
1500
2000
2500
3000
3500
Time instants from 0 to 3000 [s] with sampling time h= 300
δTB
δTA
δTC

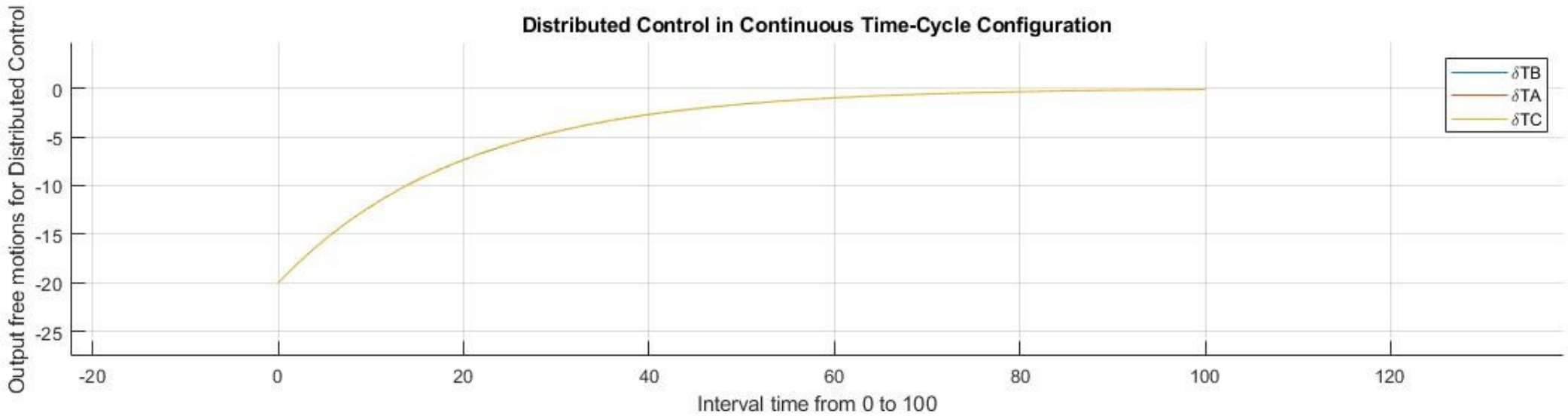

Control action in Decentralized Control, Discrete Time
Static Output-feedback Control Law u(kh)
×10^-8
5
4
3
2
1
0
-1
-2
-500
0
500
1000
1500
2000
2500
3000
3500
Time instants from 0 to 3000 [s] with sampling time h= 300
δqB
δqA
δqC

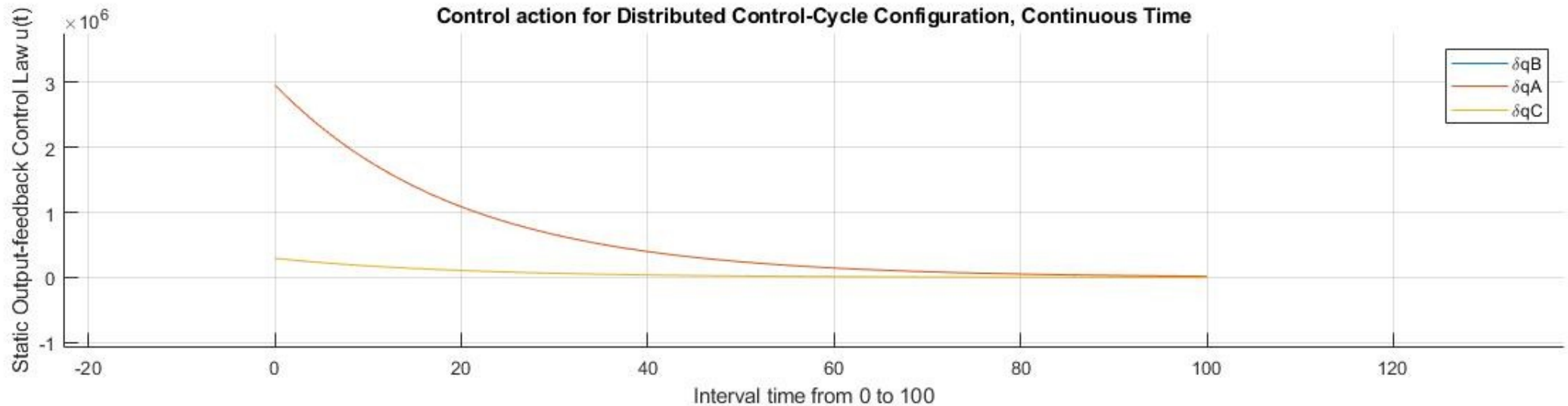
u = 1000 U = 1000


Decentralized Control in Discrete Time
Output free motions for Decentralized Control
10
5
0
-5
-10
-15
-20
-25
-500
0
500
1000
1500
2000
2500
3000
3500
4000
Time instants from 0 to 3000 [s] with sampling time h= 300
δTB
δTA
δTC

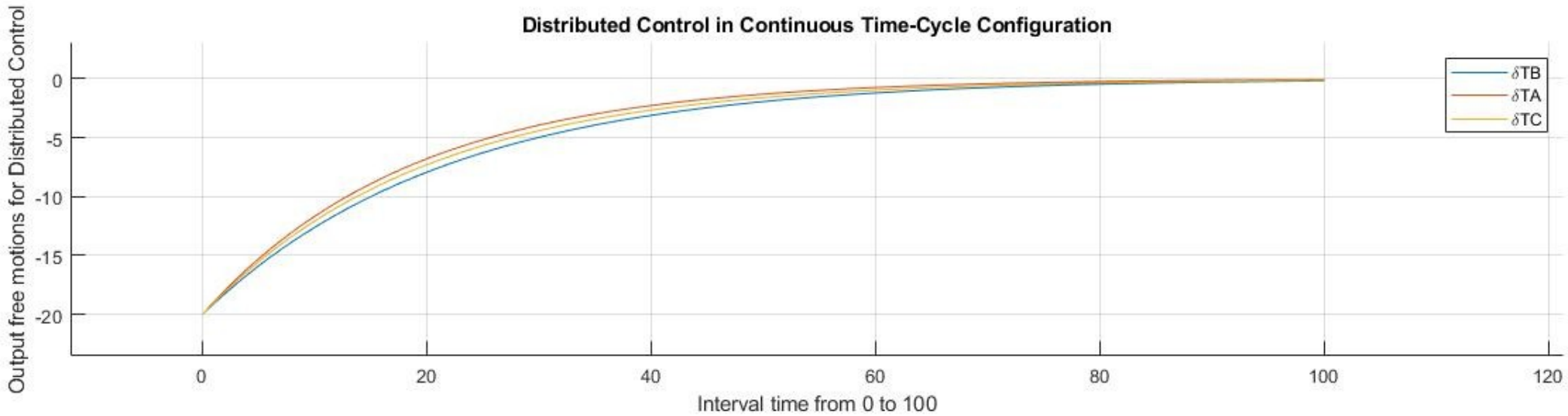

Control action in Decentralized Control, Discrete Time
Static Output-feedback Control Law u(kh)
×10^-10
4
3
2
1
0
-1
-500
0
500
1000
1500
2000
2500
3000
3500
4000
Time instants from 0 to 3000 [s] with sampling time h= 300
δqB
δqA
δqC

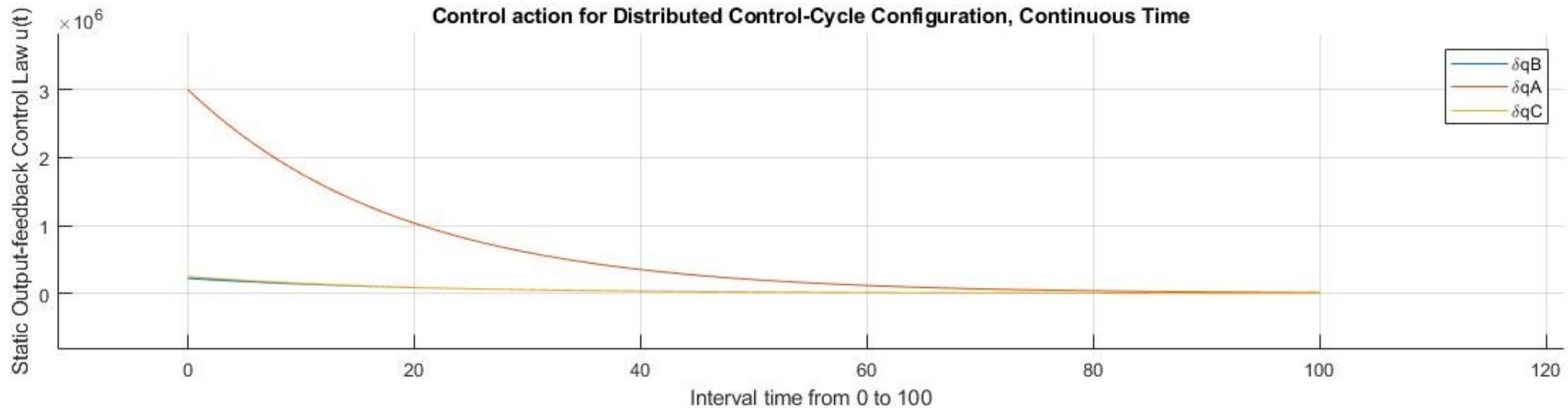
u = 2 U = 0.5


Distributed Control in Continuous Time-Cycle Configuration
Output free motions for Distributed Control
0
-5
-10
-15
-20
-25
-20
0
20
40
60
80
100
120
Interval time from 0 to 100
δTB
δTA
δTC

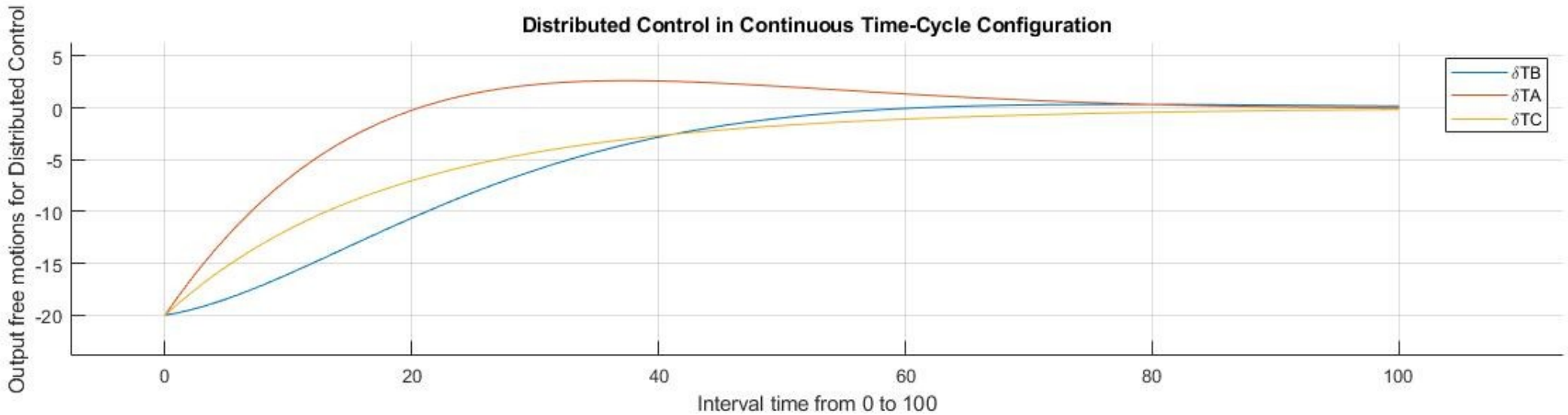

Control action for Distributed Control-Cycle Configuration, Continuous Time
Static Output-feedback Control Law u(t)
×10^6
3
2
1
0
-1
-20
0
20
40
60
80
100
120
Interval time from 0 to 100
δqB
δqA
δqC

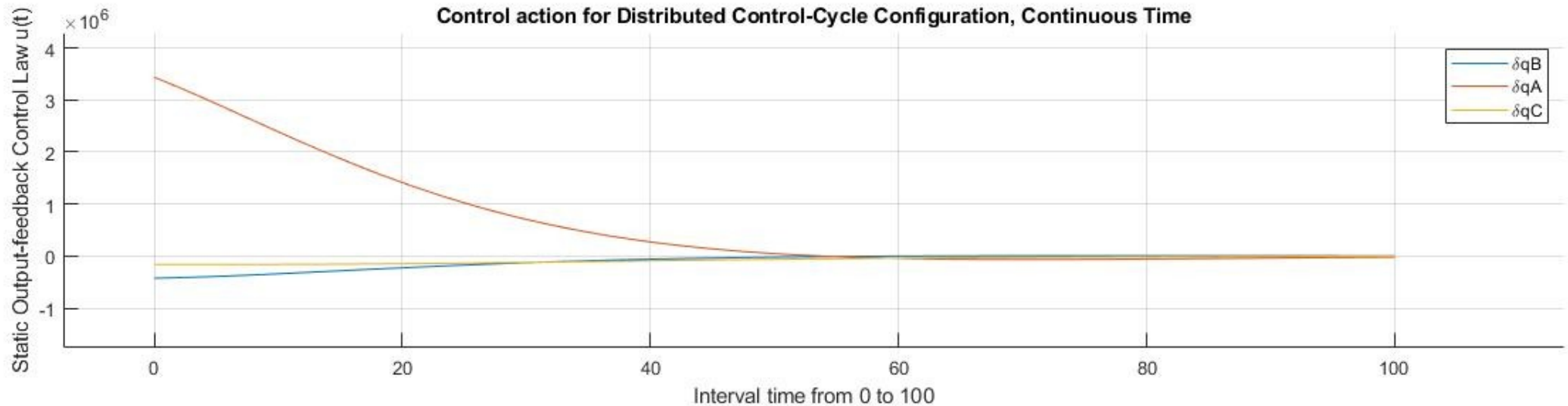
u = 100 U = 100


Distributed Control in Continuous Time-Cycle Configuration
Output free motions for Distributed Control
0
-5
-10
-15
-20
0
20
40
60
80
100
120
Interval time from 0 to 100
δTB
δTA
δTC

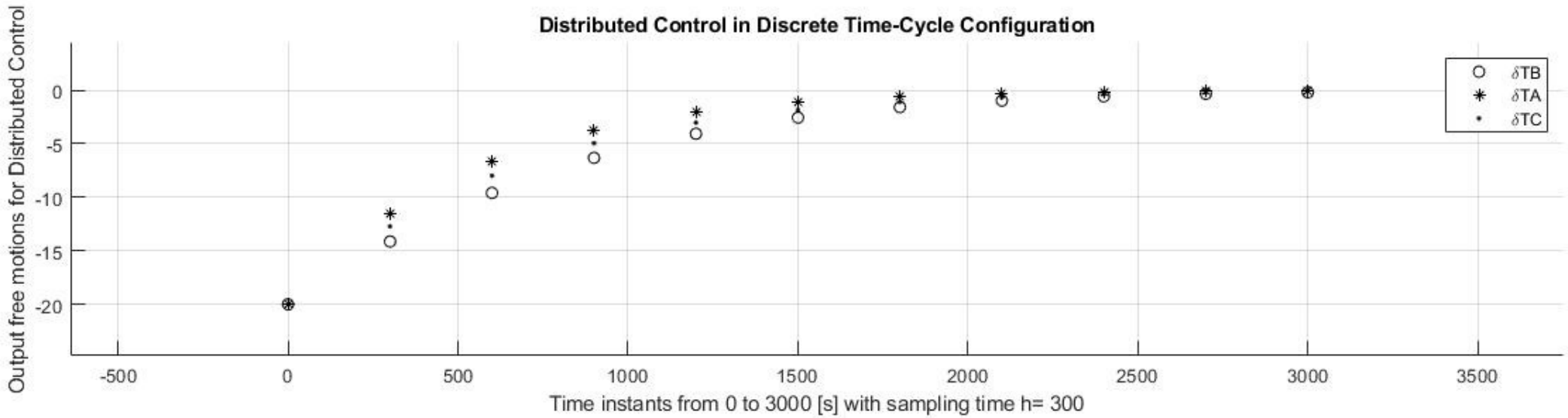

Control action for Distributed Control-Cycle Configuration, Continuous Time
×10^6
Static Output-feedback Control Law u(t)
3
2
1
0
0
20
40
60
80
100
120
Interval time from 0 to 100
δqB
δqA
δqC

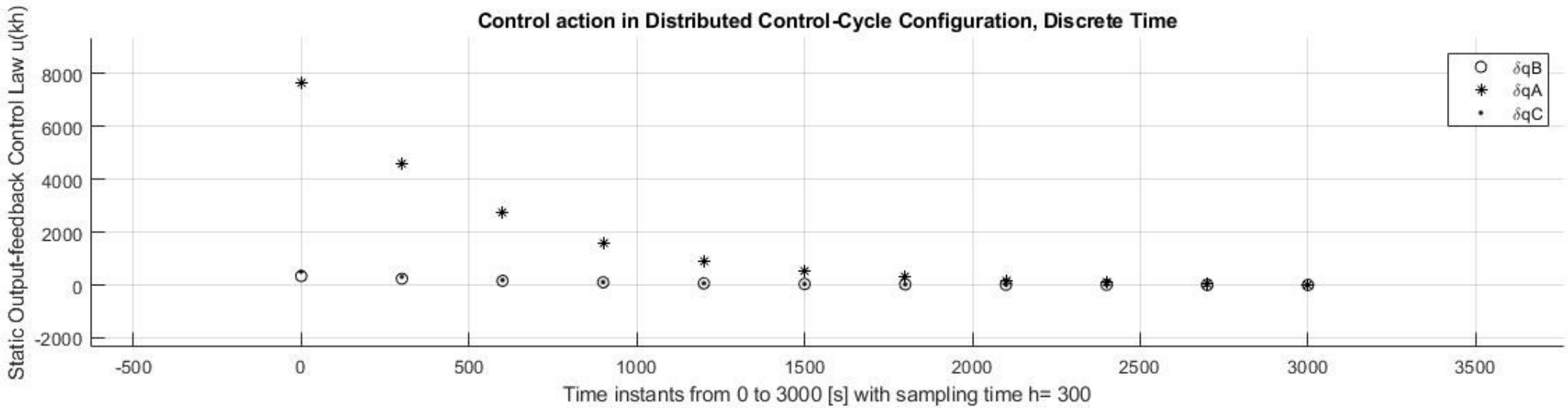
u = 1000 U = 1000


Distributed Control in Continuous Time-Cycle Configuration
Output free motions for Distributed Control
5
0
-5
-10
-15
-20
0
20
40
60
80
100
Interval time from 0 to 100
δTB
δTA
δTC

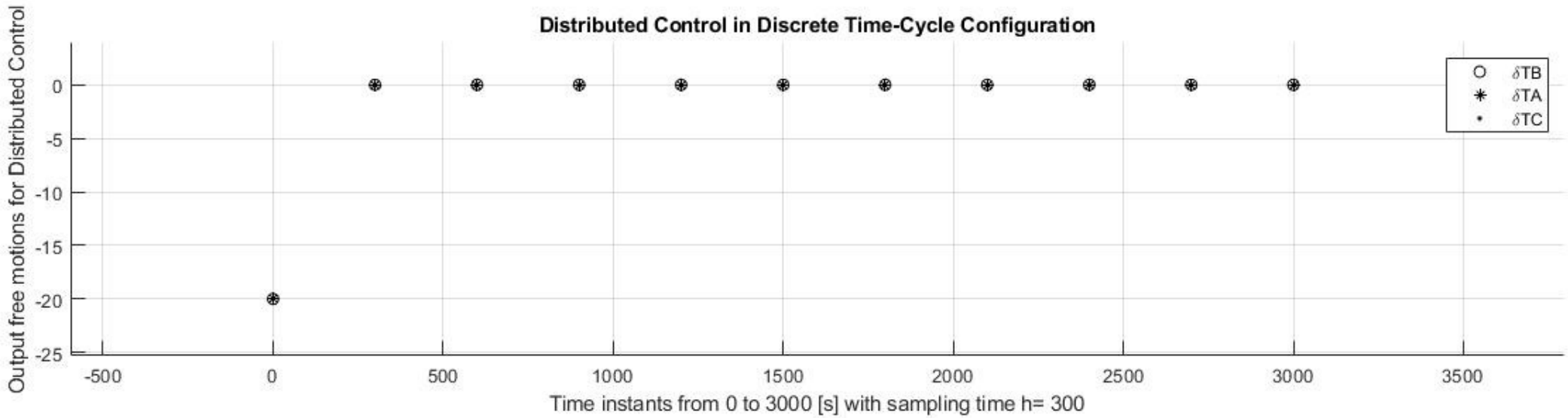

Control action for Distributed Control-Cycle Configuration, Continuous Time
Static Output-feedback Control Law u(t)
×10^6
4
3
2
1
0
-1
0
20
40
60
80
100
Interval time from 0 to 100
δqB
δqA
δqC

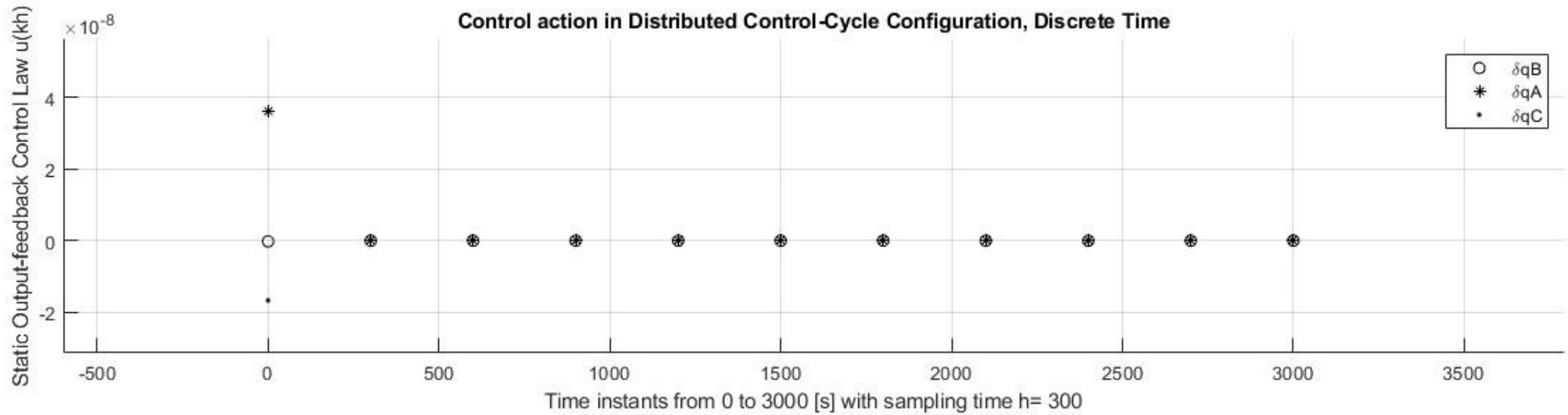
u = 2 U = 0.5


Distributed Control in Discrete Time-Cycle Configuration
Output free motions for Distributed Control
0
-5
-10
-15
-20
-500
0
500
1000
1500
2000
2500
3000
3500
Time instants from 0 to 3000 [s] with sampling time h= 300
δTB
δTA
δTC

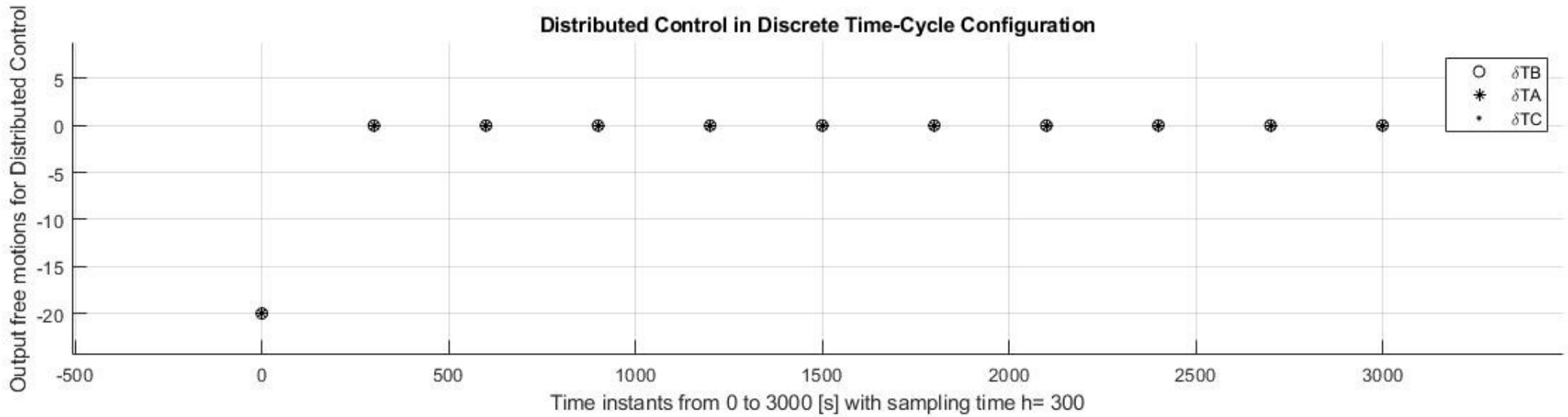

Control action in Distributed Control-Cycle Configuration, Discrete Time
Static Output-feedback Control Law u(kh)
8000
6000
4000
2000
0
-2000
-500
0
500
1000
1500
2000
2500
3000
3500
Time instants from 0 to 3000 [s] with sampling time h= 300
δqB
δqA
δqC

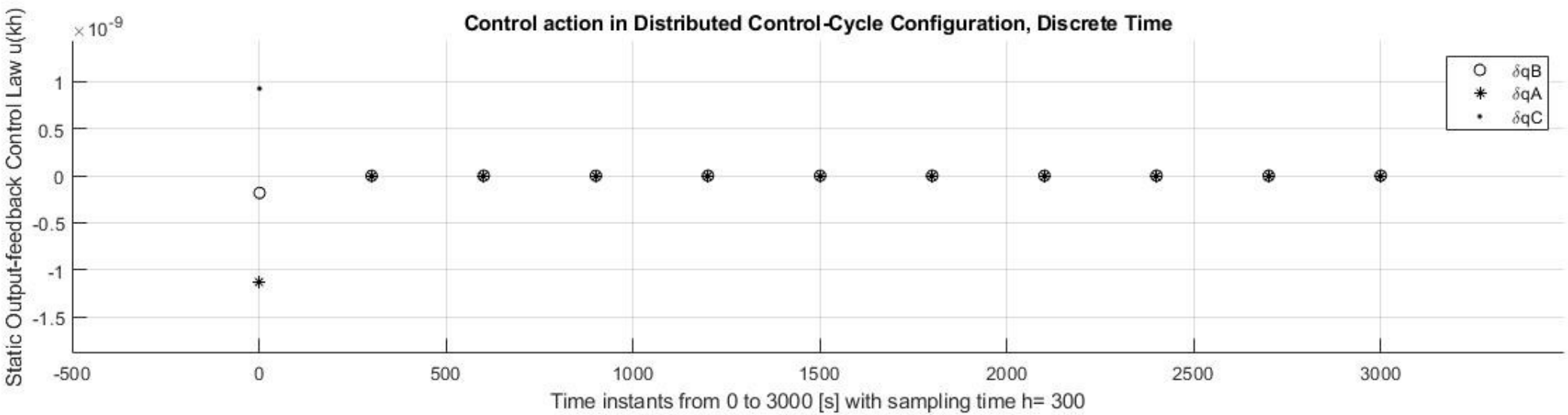
u = 100 U = 100


Distributed Control in Discrete Time-Cycle Configuration
Output free motions for Distributed Control
0
-5
-10
-15
-20
-25
-500
0
500
1000
1500
2000
2500
3000
3500
Time instants from 0 to 3000 [s] with sampling time h= 300
δTB
δTA
δTC

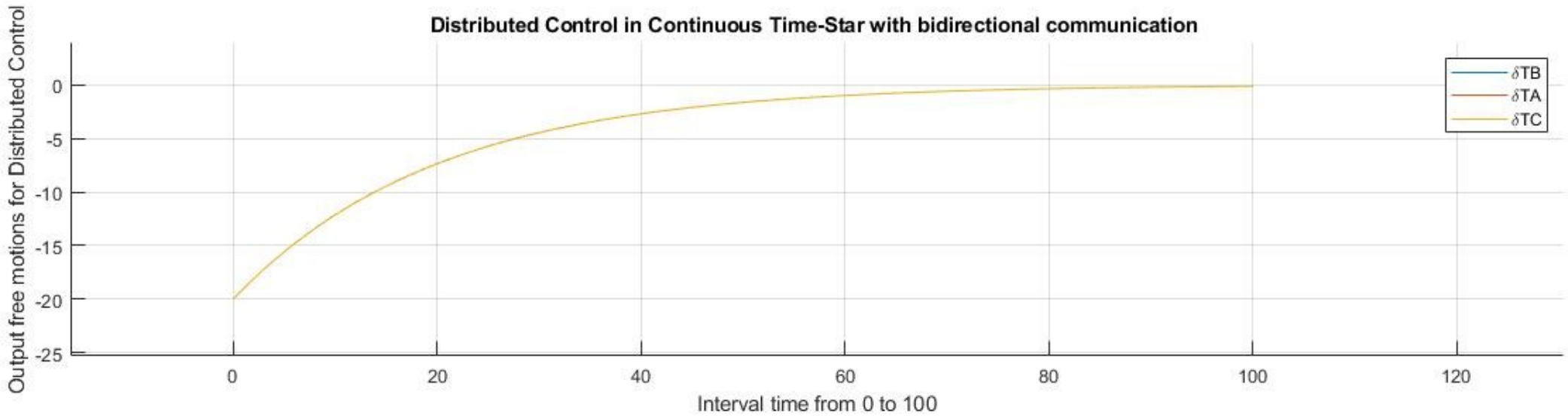

Control action in Distributed Control-Cycle Configuration, Discrete Time
Static Output-feedback Control Law u(kh)
×10^-8
4
2
0
-2
-500
0
500
1000
1500
2000
2500
3000
3500
Time instants from 0 to 3000 [s] with sampling time h= 300
δqB
δqA
δqC

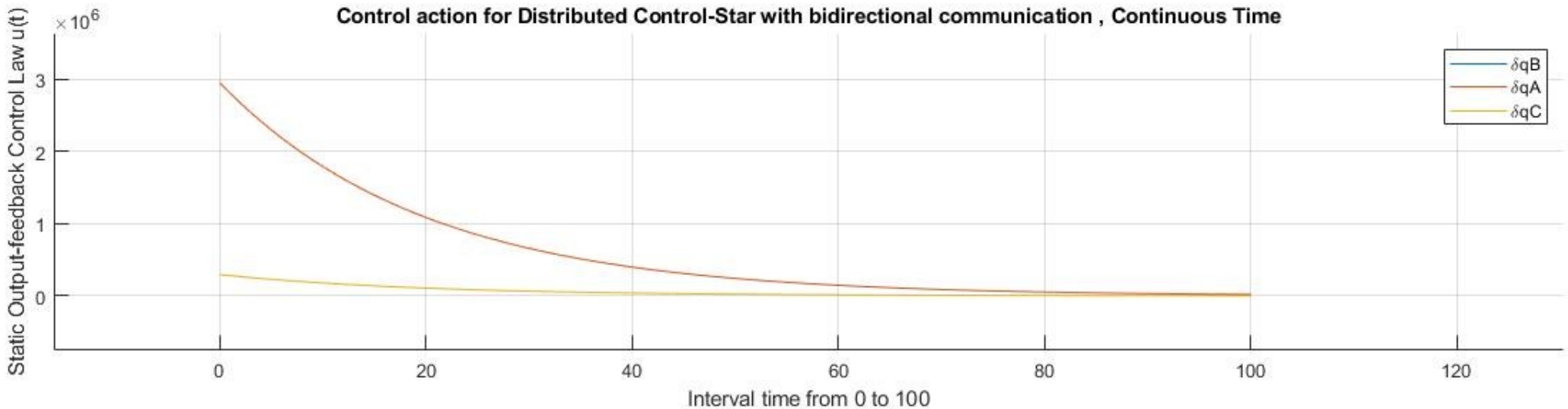
u = 1000 U = 1000


Distributed Control in Discrete Time-Cycle Configuration
Output free motions for Distributed Control
δTB
δTA
δTC
5
0
-5
-10
-15
-20
-500
0
500
1000
1500
2000
2500
3000
Time instants from 0 to 3000 [s] with sampling time h= 300

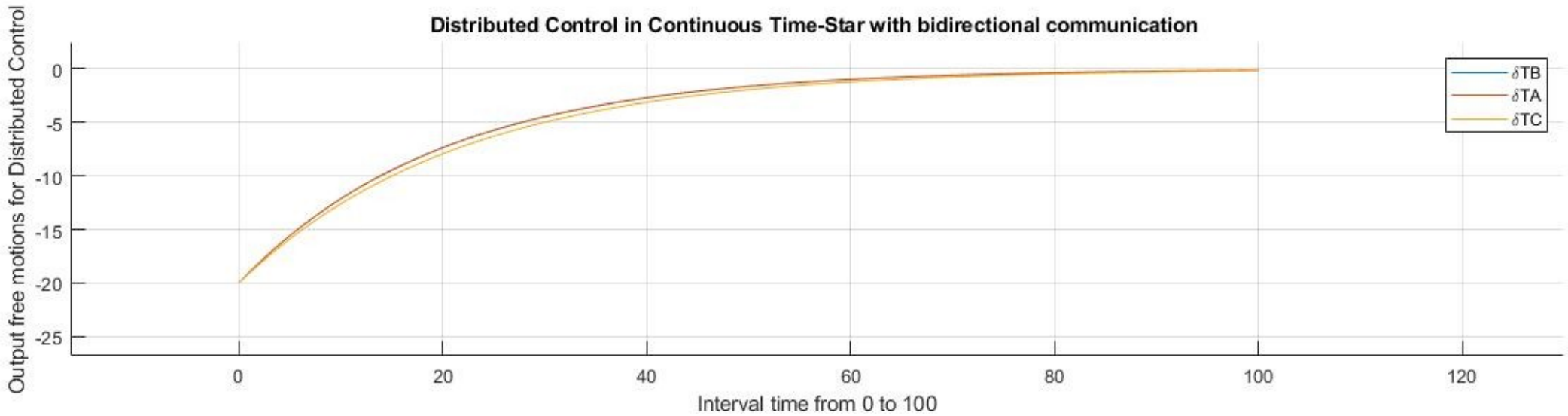

Control action in Distributed Control-Cycle Configuration, Discrete Time
Static Output-feedback Control Law u(kh)
×10^-9
δqB
δqA
δqC
1
0.5
0
-0.5
-1
-1.5
-500
0
500
1000
1500
2000
2500
3000
Time instants from 0 to 3000 [s] with sampling time h= 300

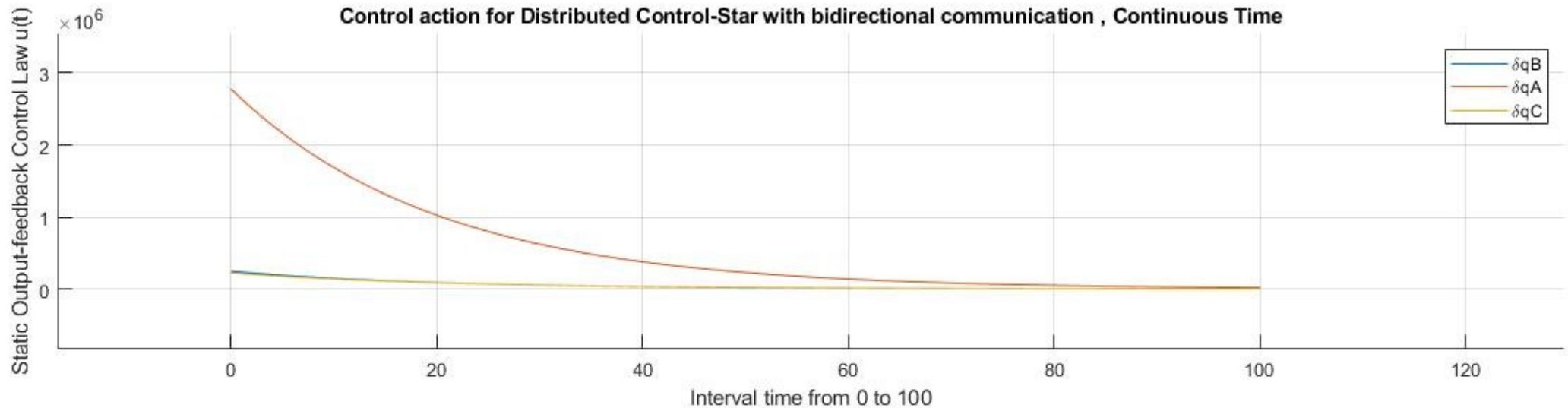
u = 2 U = 0.5


Distributed Control in Continuous Time-Star with bidirectional communication
Output free motions for Distributed Control
0
-5
-10
-15
-20
-25
0
20
40
60
80
100
120
Interval time from 0 to 100
δTB
δTA
δTC

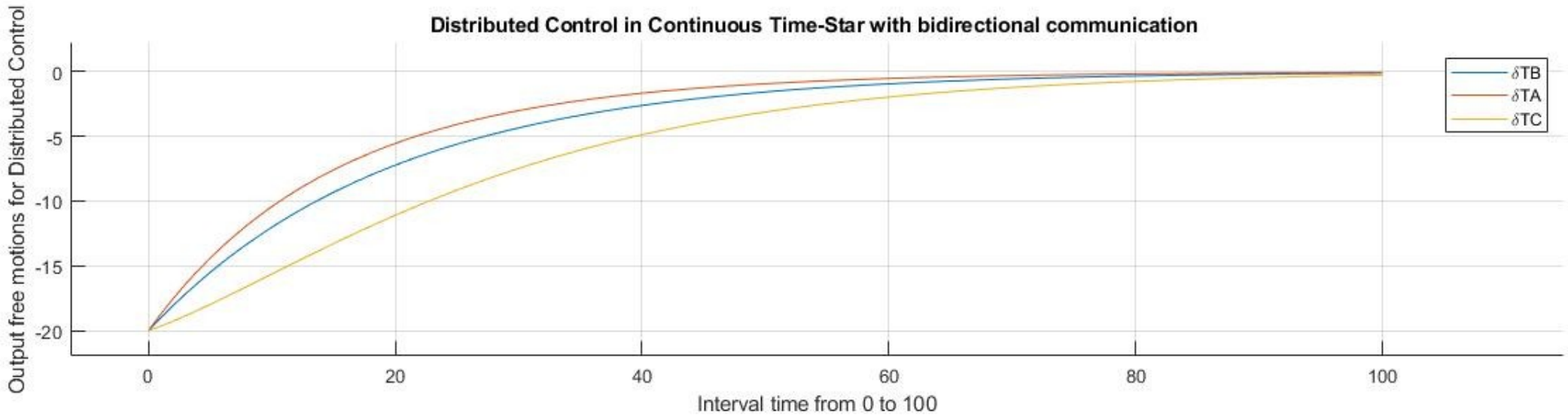

Control action for Distributed Control-Star with bidirectional communication , Continuous Time
Static Output-feedback Control Law u(t)
×10^6
3
2
1
0
0
20
40
60
80
100
120
Interval time from 0 to 100
δqB
δqA
δqC

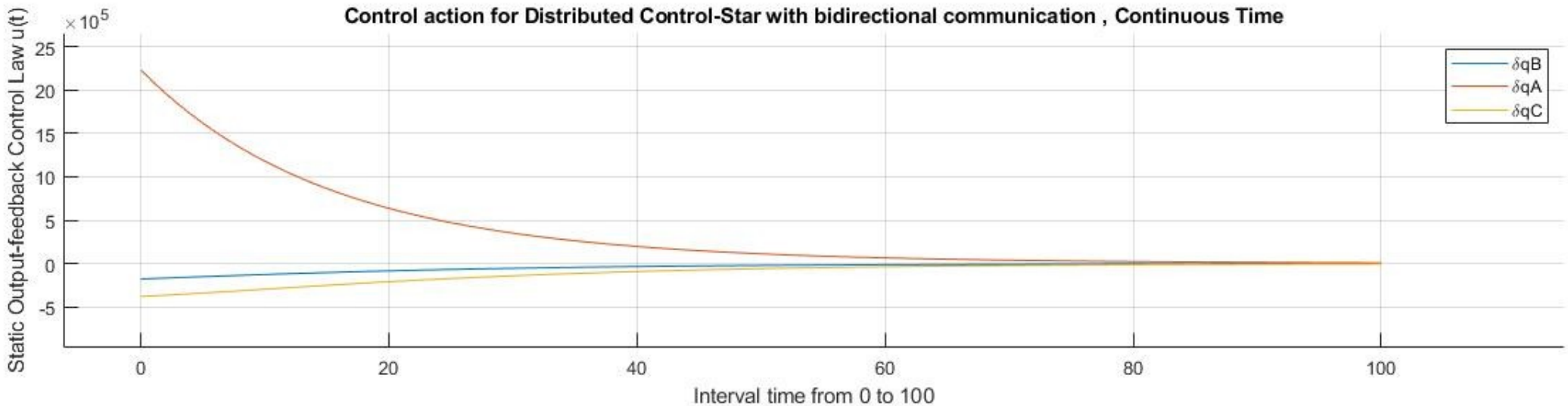
u = 100 U = 100


Distributed Control in Continuous Time-Star with bidirectional communication
Output free motions for Distributed Control
0
-5
-10
-15
-20
-25
0
20
40
60
80
100
120
Interval time from 0 to 100
δTB
δTA
δTC

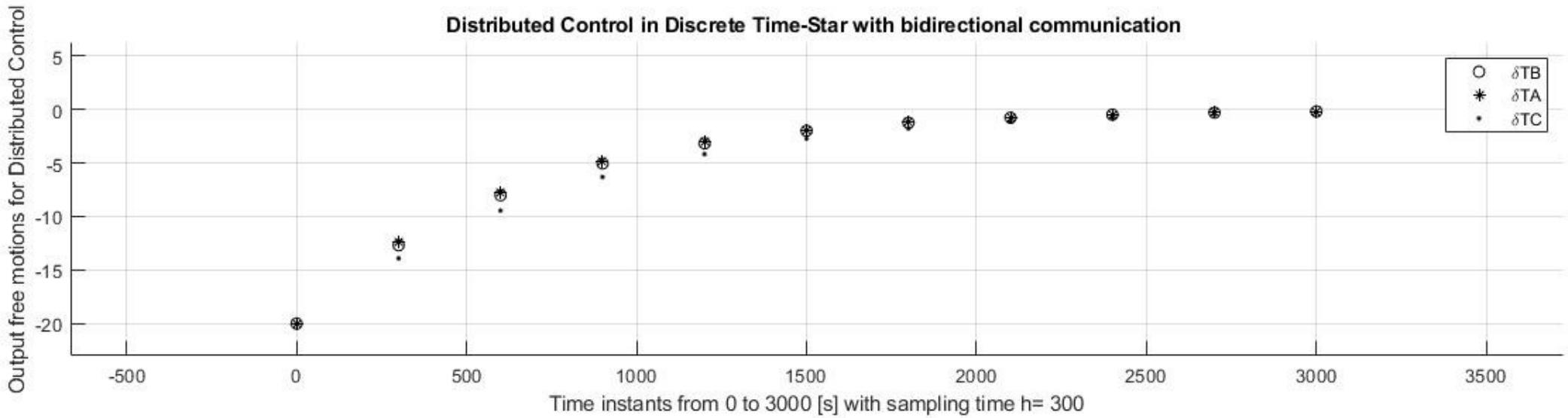

Control action for Distributed Control-Star with bidirectional communication , Continuous Time
Static Output-feedback Control Law u(t)
×10^6
3
2
1
0
0
20
40
60
80
100
120
Interval time from 0 to 100
δqB
δqA
δqC

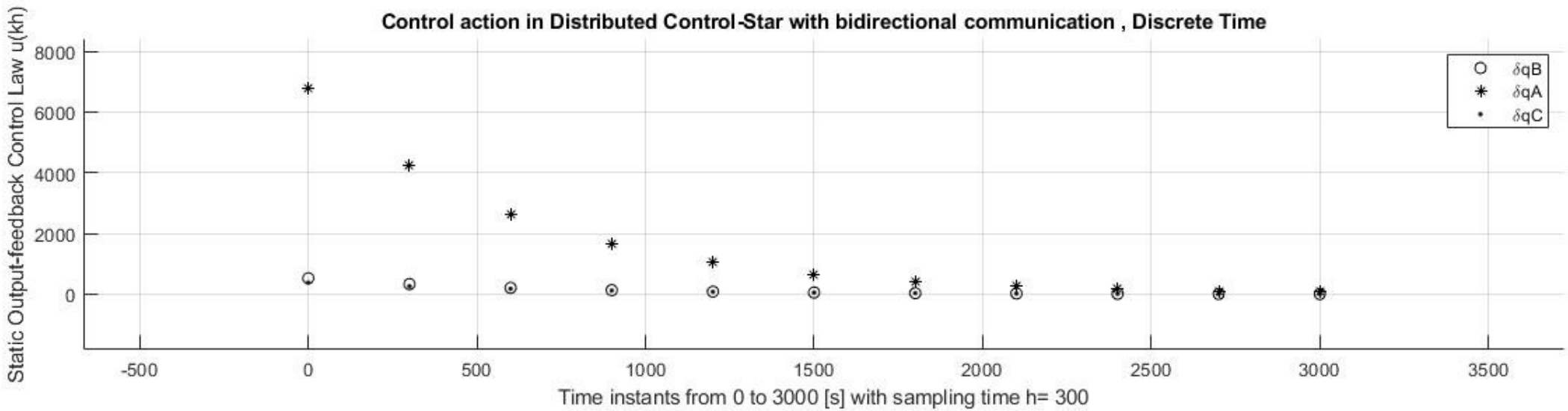
u = 1000 U = 1000


Distributed Control in Continuous Time-Star with bidirectional communication
Output free motions for Distributed Control
0
-5
-10
-15
-20
0
20
40
60
80
100
Interval time from 0 to 100
δTB
δTA
δTC

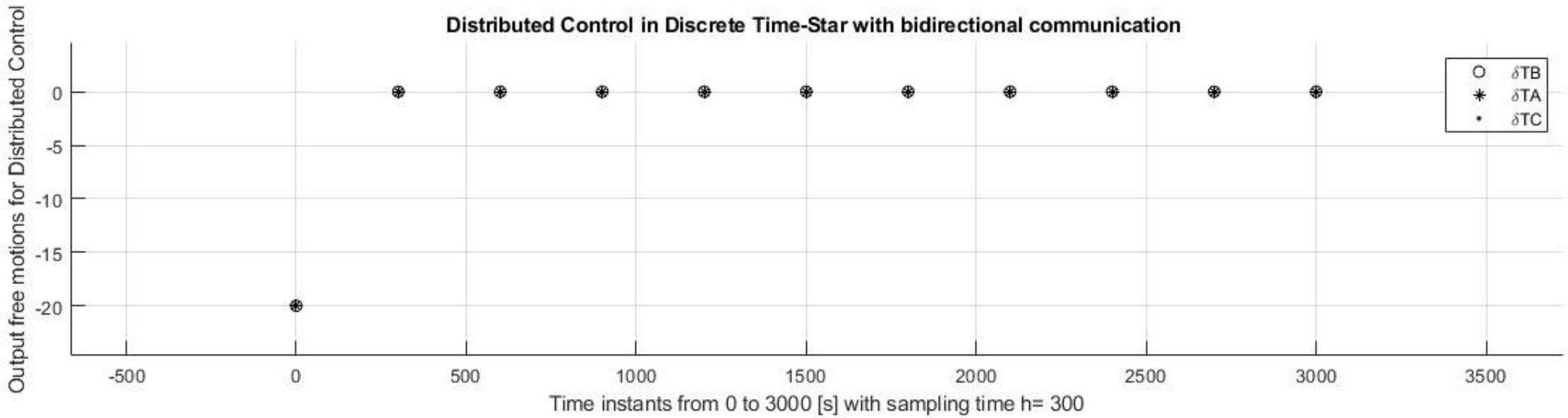

Control action for Distributed Control-Star with bidirectional communication , Continuous Time
Static Output-feedback Control Law u(t)
×10^5
25
20
15
10
5
0
-5
0
20
40
60
80
100
Interval time from 0 to 100
δqB
δqA
δqC

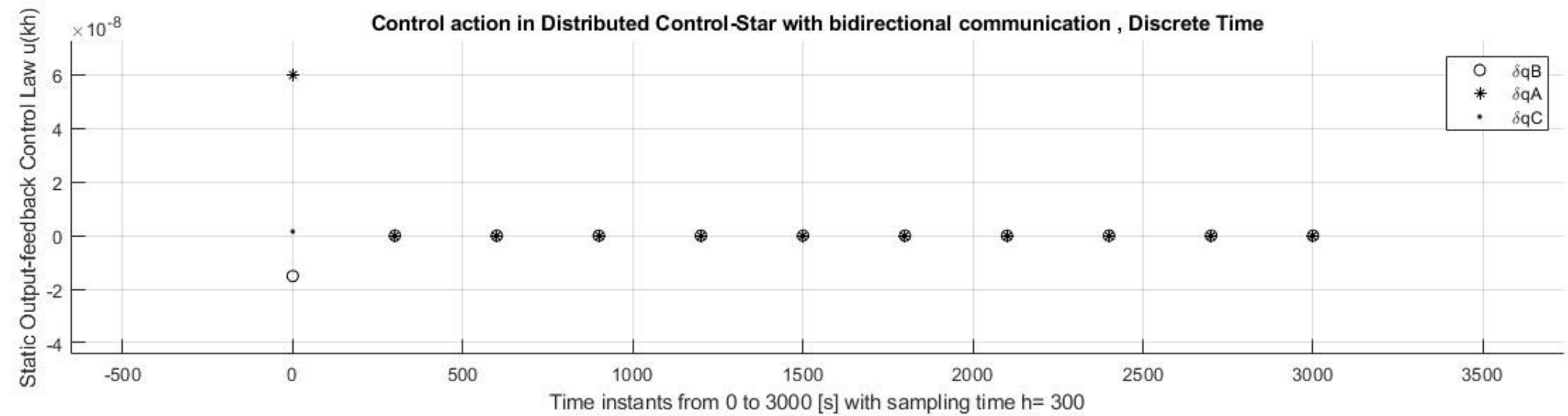
u = 2 U = 0.5


Distributed Control in Discrete Time-Star with bidirectional communication
Output free motions for Distributed Control
5
0
-5
-10
-15
-20
-500
0
500
1000
1500
2000
2500
3000
3500
Time instants from 0 to 3000 [s] with sampling time h= 300
δTB
δTA
δTC

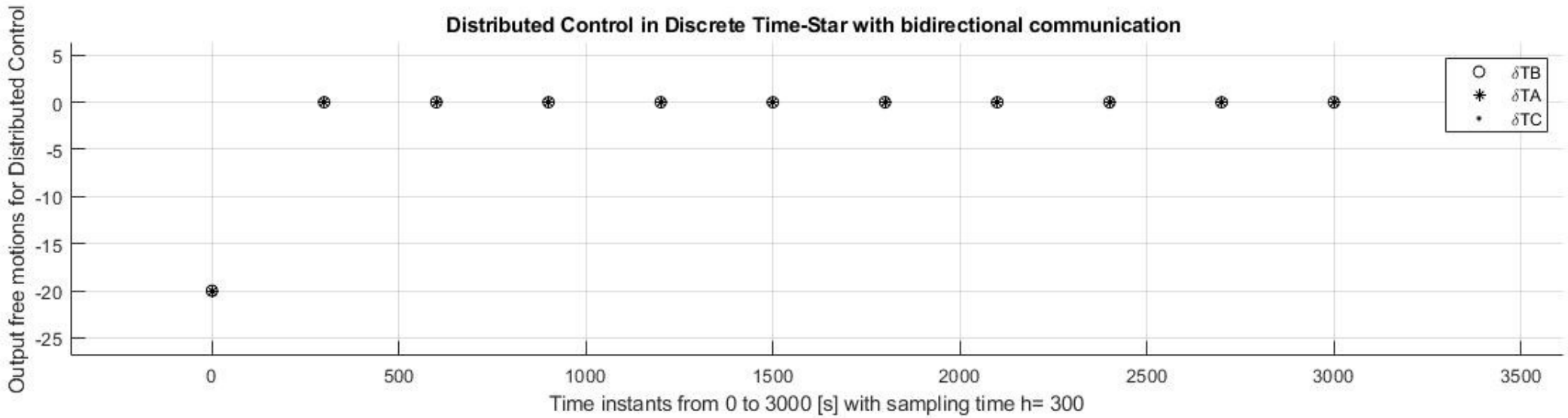

Control action in Distributed Control-Star with bidirectional communication , Discrete Time
Static Output-feedback Control Law u(kh)
8000
6000
4000
2000
0
-500
0
500
1000
1500
2000
2500
3000
3500
Time instants from 0 to 3000 [s] with sampling time h= 300
δqB
δqA
δqC

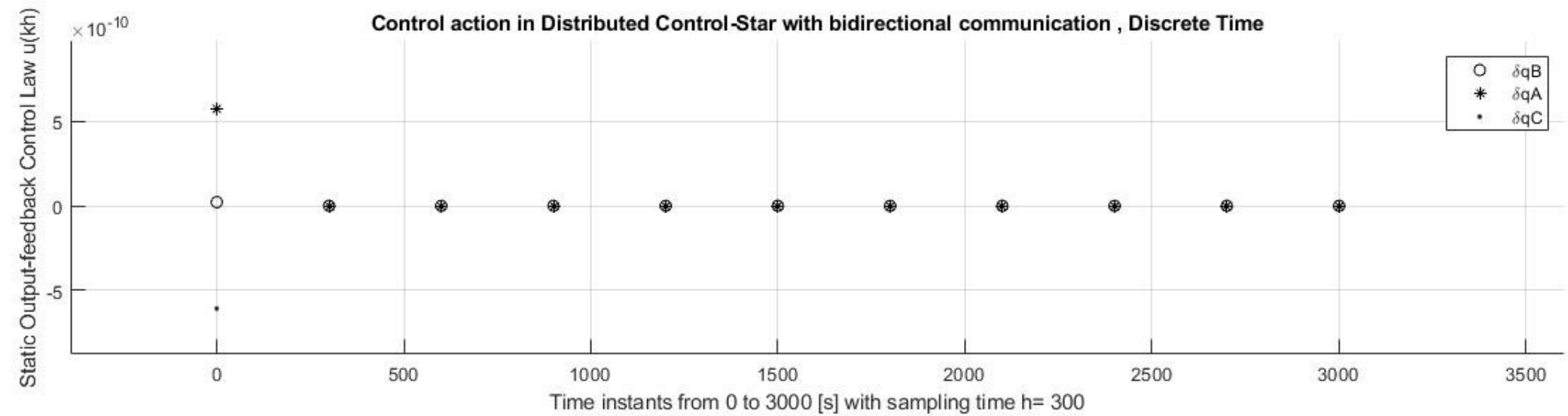
u = 100 U = 100


Distributed Control in Discrete Time-Star with bidirectional communication
Output free motions for Distributed Control
0
-5
-10
-15
-20
-500
0
500
1000
1500
2000
2500
3000
3500
Time instants from 0 to 3000 [s] with sampling time h= 300
δTB
δTA
δTC


Control action in Distributed Control-Star with bidirectional communication , Discrete Time
Static Output-feedback Control Law u(kh)
×10^-8
6
4
2
0
-2
-4
-500
0
500
1000
1500
2000
2500
3000
3500
Time instants from 0 to 3000 [s] with sampling time h= 300
δqB
δqA
δqC

u = 1000 U = 1000


Distributed Control in Discrete Time-Star with bidirectional communication
Output free motions for Distributed Control
5
0
-5
-10
-15
-20
-25
0
500
1000
1500
2000
2500
3000
3500
Time instants from 0 to 3000 [s] with sampling time h= 300
δTB
δTA
δTC


Control action in Distributed Control-Star with bidirectional communication , Discrete Time
Static Output-feedback Control Law u(kh)
×10^-10
5
0
-5
0
500
1000
1500
2000
2500
3000
3500
Time instants from 0 to 3000 [s] with sampling time h= 300
δqB
δqA
δqC