```
Python 3.6.4 |Anaconda custom (64-bit)| (default, Jan 16 2018, 10:22:32) [MSC v.1900 64 bit (AMD64)]
Type "copyright", "credits" or "license" for more information.

IPython 6.2.1 -- An enhanced Interactive Python.

Restarting kernel...
```

```
In [1]: runfile('E:/Daniel/Projects/PhD-RL-Toulouse/projects/Python/test/test_QB.py', wdir='E:/Daniel/Projects/PhD-RL-Toulouse/projects/Python/test')
Directory:
E:\Daniel\Projects\PhD-RL-Toulouse\projects
has been prepended to the module search path.
System: # servers=3, K=20, rhos=[0.4, 0.75, 0.35], buffer_size_activation=4

*** Running simulation for nparticles=400 (1 of 3) on 5 replications...




        Replication 1 of 5...

        --> Running Fleming-Viot estimation...
        Running Fleming-Viot simulation using an ABSORPTION start state to estimate blocking probability (seed=1717)...
Range of particle indices to simulate with start state #1 out of 10: [0, 6] (n=7, n/N=0.0175, p=0.046630, diff=-0.6%, state=[3, 0, 0])
Range of particle indices to simulate with start state #2 out of 10: [7, 45] (n=39, n/N=0.0975, p=0.087432, diff=0.1%, state=[2, 1, 0])
Range of particle indices to simulate with start state #3 out of 10: [46, 58] (n=13, n/N=0.0325, p=0.040801, diff=-0.2%, state=[2, 0, 1])
Range of particle indices to simulate with start state #4 out of 10: [59, 134] (n=76, n/N=0.19, p=0.163934, diff=0.2%, state=[1, 2, 0])
Range of particle indices to simulate with start state #5 out of 10: [135, 161] (n=27, n/N=0.0675, p=0.076503, diff=-0.1%, state=[1, 1, 1])
Range of particle indices to simulate with start state #6 out of 10: [162, 172] (n=11, n/N=0.0275, p=0.035701, diff=-0.2%, state=[1, 0, 2])
Range of particle indices to simulate with start state #7 out of 10: [173, 299] (n=127, n/N=0.3175, p=0.307377, diff=0.0%, state=[0, 3, 0])
Range of particle indices to simulate with start state #8 out of 10: [300, 365] (n=66, n/N=0.165, p=0.143443, diff=0.2%, state=[0, 2, 1])
Range of particle indices to simulate with start state #9 out of 10: [366, 391] (n=26, n/N=0.065, p=0.066940, diff=-0.0%, state=[0, 1, 2])
Range of particle indices to simulate with start state #10 out of 10: [392, 399] (n=8, n/N=0.02, p=0.031239, diff=-0.4%, state=[0, 0, 3])
simulate: [reactivate=True] Generating trajectories for each particle until the first ACTIVATION after the burn-in period takes place...
--> so that we can start the FV procedure.
simulate: Generating trajectories for each particle until first absorption...
--> so that we can sort ALL the first absorption times of particles and start reactivating when reactivate=True.
Generating trajectories for each particle until END OF SIMULATION (T=714.3 or #events=inf)...
Finalizing and identifying measurement times...
Estimating blocking probability with Fleming-Viot...
        --> Number of observations for P(T>t) estimation from FV simulation: 400 (N=400)
execution time: 730.9 sec, 12.2 min
        --> Running Monte-Carlo estimation...
        Step 1 of 1: Estimating the blocking probability by Monte-Carlo (seed=1719)...
Range of particle indices to simulate with start state #8 out of 15: [0, 0] (n=1, n/N=1.0, p=0.069744, diff=13.3%, state=[1, 2, 1])
simulate: Generating trajectories for each particle until first absorption...
```

```
--> so that we can sort ALL the first absorption times of particles and start reactivating when reactivate=True.
Generating trajectories for each particle until END OF SIMULATION (T=857142.9 or #events=963036)...
Finalizing and identifying measurement times...
P=0: Blocking time BEFORE removal: t=384.038, n=831
P=0: Blocking time AFTER removal: t=384.038, n=831
Estimating blocking probability with Monte-Carlo...
        --> Number of observations for Pr(K) estimation: 116008 (37.5% of simulation time T=857142.9)
execution time: 1399.8 sec, 23.3 min
execution time MC + FV: 2130.7 sec, 35.5 min
Computing TRUE blocking probability for nservers=3, K=20, rhos=[0.4, 0.75, 0.35]...
        P(K) by MC: 0.119435% (simulation time = 857142.9)
        P(K) estimated by FV: 0.032446%, E(T) = 4.8 (simulation time = 714.3)
        True P(K): 0.124693%




        Replication 2 of 5...

        --> Running Fleming-Viot estimation...
        Running Fleming-Viot simulation using an ABSORPTION start state to estimate blocking probability (seed=1727)...
Range of particle indices to simulate with start state #1 out of 10: [0, 20] (n=21, n/N=0.0525, p=0.046630, diff=0.1%, state=[3, 0, 0])
Range of particle indices to simulate with start state #2 out of 10: [21, 49] (n=29, n/N=0.0725, p=0.087432, diff=-0.2%, state=[2, 1, 0])
Range of particle indices to simulate with start state #3 out of 10: [50, 67] (n=18, n/N=0.045, p=0.040801, diff=0.1%, state=[2, 0, 1])
Range of particle indices to simulate with start state #4 out of 10: [68, 141] (n=74, n/N=0.185, p=0.163934, diff=0.1%, state=[1, 2, 0])
Range of particle indices to simulate with start state #5 out of 10: [142, 171] (n=30, n/N=0.075, p=0.076503, diff=-0.0%, state=[1, 1, 1])
Range of particle indices to simulate with start state #6 out of 10: [172, 181] (n=10, n/N=0.025, p=0.035701, diff=-0.3%, state=[1, 0, 2])
Range of particle indices to simulate with start state #7 out of 10: [182, 303] (n=122, n/N=0.305, p=0.307377, diff=-0.0%, state=[0, 3, 0])
Range of particle indices to simulate with start state #8 out of 10: [304, 370] (n=67, n/N=0.1675, p=0.143443, diff=0.2%, state=[0, 2, 1])
Range of particle indices to simulate with start state #9 out of 10: [371, 392] (n=22, n/N=0.055, p=0.066940, diff=-0.2%, state=[0, 1, 2])
Range of particle indices to simulate with start state #10 out of 10: [393, 399] (n=7, n/N=0.0175, p=0.031239, diff=-0.4%, state=[0, 0, 3])
simulate: [reactivate=True] Generating trajectories for each particle until the first ACTIVATION after the burn-in period takes place...
--> so that we can start the FV procedure.
simulate: Generating trajectories for each particle until first absorption...
--> so that we can sort ALL the first absorption times of particles and start reactivating when reactivate=True.
Generating trajectories for each particle until END OF SIMULATION (T=714.3 or #events=inf)...
Finalizing and identifying measurement times...
Estimating blocking probability with Fleming-Viot...
        --> Number of observations for P(T>t) estimation from FV simulation: 400 (N=400)
execution time: 704.2 sec, 11.7 min
        --> Running Monte-Carlo estimation...
        Step 1 of 1: Estimating the blocking probability by Monte-Carlo (seed=1729)...
Range of particle indices to simulate with start state #6 out of 15: [0, 0] (n=1, n/N=1.0, p=0.017358, diff=56.6%, state=[2, 0, 2])
simulate: Generating trajectories for each particle until first absorption...
--> so that we can sort ALL the first absorption times of particles and start reactivating when reactivate=True.
Generating trajectories for each particle until END OF SIMULATION (T=857142.9 or #events=963715)...
Finalizing and identifying measurement times...
P=0: Blocking time BEFORE removal: t=313.752, n=686
```

```
P=0: Blocking time AFTER removal: t=313.752, n=686
Estimating blocking probability with Monte-Carlo...
        --> Number of observations for Pr(K) estimation: 118506 (37.6% of simulation time T=857142.9)
execution time: 1344.9 sec, 22.4 min
execution time MC + FV: 2050.5 sec, 34.2 min
        P(K) by MC: 0.097475% (simulation time = 857142.9)
        P(K) estimated by FV: 0.070551%, E(T) = 4.9 (simulation time = 714.3)
        True P(K): 0.124693%




        Replication 3 of 5...

        --> Running Fleming-Viot estimation...
        Running Fleming-Viot simulation using an ABSORPTION start state to estimate blocking probability (seed=1737)...
Range of particle indices to simulate with start state #1 out of 10: [0, 10] (n=11, n/N=0.0275, p=0.046630, diff=-0.4%, state=[3, 0, 0])
Range of particle indices to simulate with start state #2 out of 10: [11, 44] (n=34, n/N=0.085, p=0.087432, diff=-0.0%, state=[2, 1, 0])
Range of particle indices to simulate with start state #3 out of 10: [45, 63] (n=19, n/N=0.0475, p=0.040801, diff=0.2%, state=[2, 0, 1])
Range of particle indices to simulate with start state #4 out of 10: [64, 134] (n=71, n/N=0.1775, p=0.163934, diff=0.1%, state=[1, 2, 0])
Range of particle indices to simulate with start state #5 out of 10: [135, 162] (n=28, n/N=0.07, p=0.076503, diff=-0.1%, state=[1, 1, 1])
Range of particle indices to simulate with start state #6 out of 10: [163, 178] (n=16, n/N=0.04, p=0.035701, diff=0.1%, state=[1, 0, 2])
Range of particle indices to simulate with start state #7 out of 10: [179, 304] (n=126, n/N=0.315, p=0.307377, diff=0.0%, state=[0, 3, 0])
Range of particle indices to simulate with start state #8 out of 10: [305, 370] (n=66, n/N=0.165, p=0.143443, diff=0.2%, state=[0, 2, 1])
Range of particle indices to simulate with start state #9 out of 10: [371, 388] (n=18, n/N=0.045, p=0.066940, diff=-0.3%, state=[0, 1, 2])
Range of particle indices to simulate with start state #10 out of 10: [389, 399] (n=11, n/N=0.0275, p=0.031239, diff=-0.1%, state=[0, 0, 3])
simulate: [reactivate=True] Generating trajectories for each particle until the first ACTIVATION after the burn-in period takes place...
--> so that we can start the FV procedure.
simulate: Generating trajectories for each particle until first absorption...
--> so that we can sort ALL the first absorption times of particles and start reactivating when reactivate=True.
Generating trajectories for each particle until END OF SIMULATION (T=714.3 or #events=inf)...
Finalizing and identifying measurement times...
Estimating blocking probability with Fleming-Viot...
        --> Number of observations for P(T>t) estimation from FV simulation: 400 (N=400)
execution time: 706.4 sec, 11.8 min
        --> Running Monte-Carlo estimation...
        Step 1 of 1: Estimating the blocking probability by Monte-Carlo (seed=1739)...
Range of particle indices to simulate with start state #11 out of 15: [0, 0] (n=1, n/N=1.0, p=0.280221, diff=2.6%, state=[0, 4, 0])
simulate: Generating trajectories for each particle until first absorption...
--> so that we can sort ALL the first absorption times of particles and start reactivating when reactivate=True.
Generating trajectories for each particle until END OF SIMULATION (T=857142.9 or #events=964423)...
Finalizing and identifying measurement times...
P=0: Blocking time BEFORE removal: t=435.380, n=897
P=0: Blocking time AFTER removal: t=435.380, n=897
Estimating blocking probability with Monte-Carlo...
        --> Number of observations for Pr(K) estimation: 117654 (37.5% of simulation time T=857142.9)
execution time: 1317.2 sec, 22.0 min
execution time MC + FV: 2024.9 sec, 33.7 min
```

```
        P(K) by MC: 0.135325% (simulation time = 857142.9)
        P(K) estimated by FV: 0.020176%, E(T) = 4.6 (simulation time = 714.3)
        True P(K): 0.124693%



        Replication 4 of 5...

        --> Running Fleming-Viot estimation...
        Running Fleming-Viot simulation using an ABSORPTION start state to estimate blocking probability (seed=1747)...
Range of particle indices to simulate with start state #1 out of 10: [0, 19] (n=20, n/N=0.05, p=0.046630, diff=0.1%, state=[3, 0, 0])
Range of particle indices to simulate with start state #2 out of 10: [20, 51] (n=32, n/N=0.08, p=0.087432, diff=-0.1%, state=[2, 1, 0])
Range of particle indices to simulate with start state #3 out of 10: [52, 72] (n=21, n/N=0.0525, p=0.040801, diff=0.3%, state=[2, 0, 1])
Range of particle indices to simulate with start state #4 out of 10: [73, 142] (n=70, n/N=0.175, p=0.163934, diff=0.1%, state=[1, 2, 0])
Range of particle indices to simulate with start state #5 out of 10: [143, 177] (n=35, n/N=0.0875, p=0.076503, diff=0.1%, state=[1, 1, 1])
Range of particle indices to simulate with start state #6 out of 10: [178, 197] (n=20, n/N=0.05, p=0.035701, diff=0.4%, state=[1, 0, 2])
Range of particle indices to simulate with start state #7 out of 10: [198, 309] (n=112, n/N=0.28, p=0.307377, diff=-0.1%, state=[0, 3, 0])
Range of particle indices to simulate with start state #8 out of 10: [310, 361] (n=52, n/N=0.13, p=0.143443, diff=-0.1%, state=[0, 2, 1])
Range of particle indices to simulate with start state #9 out of 10: [362, 388] (n=27, n/N=0.0675, p=0.066940, diff=0.0%, state=[0, 1, 2])
Range of particle indices to simulate with start state #10 out of 10: [389, 399] (n=11, n/N=0.0275, p=0.031239, diff=-0.1%, state=[0, 0, 3])
simulate: [reactivate=True] Generating trajectories for each particle until the first ACTIVATION after the burn-in period takes place...
--> so that we can start the FV procedure.
simulate: Generating trajectories for each particle until first absorption...
--> so that we can sort ALL the first absorption times of particles and start reactivating when reactivate=True.
Generating trajectories for each particle until END OF SIMULATION (T=714.3 or #events=inf)...
Finalizing and identifying measurement times...
Estimating blocking probability with Fleming-Viot...
        --> Number of observations for P(T>t) estimation from FV simulation: 400 (N=400)
execution time: 707.1 sec, 11.8 min
        --> Running Monte-Carlo estimation...
        Step 1 of 1: Estimating the blocking probability by Monte-Carlo (seed=1749)...
Range of particle indices to simulate with start state #11 out of 15: [0, 0] (n=1, n/N=1.0, p=0.280221, diff=2.6%, state=[0, 4, 0])
simulate: Generating trajectories for each particle until first absorption...
--> so that we can sort ALL the first absorption times of particles and start reactivating when reactivate=True.
Generating trajectories for each particle until END OF SIMULATION (T=857142.9 or #events=964856)...
Finalizing and identifying measurement times...
P=0: Blocking time BEFORE removal: t=489.421, n=955
P=0: Blocking time AFTER removal: t=489.421, n=955
Estimating blocking probability with Monte-Carlo...
        --> Number of observations for Pr(K) estimation: 118326 (37.5% of simulation time T=857142.9)
execution time: 1339.2 sec, 22.3 min
execution time MC + FV: 2047.7 sec, 34.1 min
        P(K) by MC: 0.152260% (simulation time = 857142.9)
        P(K) estimated by FV: 0.049644%, E(T) = 5.2 (simulation time = 714.3)
        True P(K): 0.124693%
```

```
        Replication 5 of 5...

        --> Running Fleming-Viot estimation...
        Running Fleming-Viot simulation using an ABSORPTION start state to estimate blocking probability (seed=1757)...
Range of particle indices to simulate with start state #1 out of 10: [0, 21] (n=22, n/N=0.055, p=0.046630, diff=0.2%, state=[3, 0, 0])
Range of particle indices to simulate with start state #2 out of 10: [22, 63] (n=42, n/N=0.105, p=0.087432, diff=0.2%, state=[2, 1, 0])
Range of particle indices to simulate with start state #3 out of 10: [64, 80] (n=17, n/N=0.0425, p=0.040801, diff=0.0%, state=[2, 0, 1])
Range of particle indices to simulate with start state #4 out of 10: [81, 154] (n=74, n/N=0.185, p=0.163934, diff=0.1%, state=[1, 2, 0])
Range of particle indices to simulate with start state #5 out of 10: [155, 178] (n=24, n/N=0.06, p=0.076503, diff=-0.2%, state=[1, 1, 1])
Range of particle indices to simulate with start state #6 out of 10: [179, 195] (n=17, n/N=0.0425, p=0.035701, diff=0.2%, state=[1, 0, 2])
Range of particle indices to simulate with start state #7 out of 10: [196, 296] (n=101, n/N=0.2525, p=0.307377, diff=-0.2%, state=[0, 3, 0])
Range of particle indices to simulate with start state #8 out of 10: [297, 362] (n=66, n/N=0.165, p=0.143443, diff=0.2%, state=[0, 2, 1])
Range of particle indices to simulate with start state #9 out of 10: [363, 385] (n=23, n/N=0.0575, p=0.066940, diff=-0.1%, state=[0, 1, 2])
Range of particle indices to simulate with start state #10 out of 10: [386, 399] (n=14, n/N=0.035, p=0.031239, diff=0.1%, state=[0, 0, 3])
simulate: [reactivate=True] Generating trajectories for each particle until the first ACTIVATION after the burn-in period takes place...
--> so that we can start the FV procedure.
simulate: Generating trajectories for each particle until first absorption...
--> so that we can sort ALL the first absorption times of particles and start reactivating when reactivate=True.
Generating trajectories for each particle until END OF SIMULATION (T=714.3 or #events=inf)...
Finalizing and identifying measurement times...
Estimating blocking probability with Fleming-Viot...
        --> Number of observations for P(T>t) estimation from FV simulation: 400 (N=400)
execution time: 711.9 sec, 11.9 min
        --> Running Monte-Carlo estimation...
        Step 1 of 1: Estimating the blocking probability by Monte-Carlo (seed=1759)...
Range of particle indices to simulate with start state #11 out of 15: [0, 0] (n=1, n/N=1.0, p=0.280221, diff=2.6%, state=[0, 4, 0])
simulate: Generating trajectories for each particle until first absorption...
--> so that we can sort ALL the first absorption times of particles and start reactivating when reactivate=True.
Generating trajectories for each particle until END OF SIMULATION (T=857142.9 or #events=965164)...
Finalizing and identifying measurement times...
P=0: Blocking time BEFORE removal: t=319.144, n=682
P=0: [<EventType.ABSORPTION: 0>] events at time 321943.1 removed.
P=0: Blocking time AFTER removal: t=319.144, n=682
Estimating blocking probability with Monte-Carlo...
        --> Number of observations for Pr(K) estimation: 117640 (37.6% of simulation time T=857142.9)
execution time: 1312.3 sec, 21.9 min
execution time MC + FV: 2025.5 sec, 33.8 min
        P(K) by MC: 0.099130% (simulation time = 857142.9)
        P(K) estimated by FV: 0.166279%, E(T) = 5.7 (simulation time = 714.3)
        True P(K): 0.124693%
Results:
    K BSA    N replication    Pr(MC)       Time(MC) #Events(MC) #Cycles(MC)  \
1  20   4  400           1  0.001194  321546.015846      963036      116008
1  20   4  400           2  0.000975  321879.831934      963715      118506
1  20   4  400           3  0.001353  321728.304065      964423      117654
1  20   4  400           4  0.001523  321438.783784      964856      118326
```

```
1  20   4  400          5  0.000991  321942.989753      965164      117640

       E(T) #Cycles(E(T))    Pr(FV)       Time(FV) #Events(FV) #Samples(S(t))  \
1  4.832810           400  0.000324  285714.285714      963036            400
1  4.937839           400  0.000706  285714.285714      963715            400
1  4.631286           400  0.000202  285714.285714      964423            400
1  5.189424           400  0.000496  285714.285714      964856            400
1  5.682567           400  0.001663  285714.285714      965164            400

      Pr(K)  seed    exec_time
1  0.001247  1719  2130.731570
1  0.001247  1729  2050.486265
1  0.001247  1739  2024.931174
1  0.001247  1749  2047.680548
1  0.001247  1759  2025.490302

*** Running simulation for nparticles=800 (2 of 3) on 5 replications...




        Replication 1 of 5...

        --> Running Fleming-Viot estimation...
        Running Fleming-Viot simulation using an ABSORPTION start state to estimate blocking probability (seed=1717)...
Range of particle indices to simulate with start state #1 out of 10: [0, 22] (n=23, n/N=0.02875, p=0.046630, diff=-0.4%, state=[3, 0, 0])
Range of particle indices to simulate with start state #2 out of 10: [23, 94] (n=72, n/N=0.09, p=0.087432, diff=0.0%, state=[2, 1, 0])
Range of particle indices to simulate with start state #3 out of 10: [95, 114] (n=20, n/N=0.025, p=0.040801, diff=-0.4%, state=[2, 0, 1])
Range of particle indices to simulate with start state #4 out of 10: [115, 255] (n=141, n/N=0.17625, p=0.163934, diff=0.1%, state=[1, 2, 0])
Range of particle indices to simulate with start state #5 out of 10: [256, 311] (n=56, n/N=0.07, p=0.076503, diff=-0.1%, state=[1, 1, 1])
Range of particle indices to simulate with start state #6 out of 10: [312, 340] (n=29, n/N=0.03625, p=0.035701, diff=0.0%, state=[1, 0, 2])
Range of particle indices to simulate with start state #7 out of 10: [341, 582] (n=242, n/N=0.3025, p=0.307377, diff=-0.0%, state=[0, 3, 0])
Range of particle indices to simulate with start state #8 out of 10: [583, 712] (n=130, n/N=0.1625, p=0.143443, diff=0.1%, state=[0, 2, 1])
Range of particle indices to simulate with start state #9 out of 10: [713, 777] (n=65, n/N=0.08125, p=0.066940, diff=0.2%, state=[0, 1, 2])
Range of particle indices to simulate with start state #10 out of 10: [778, 799] (n=22, n/N=0.0275, p=0.031239, diff=-0.1%, state=[0, 0, 3])
simulate: [reactivate=True] Generating trajectories for each particle until the first ACTIVATION after the burn-in period takes place...
--> so that we can start the FV procedure.
simulate: Generating trajectories for each particle until first absorption...
--> so that we can sort ALL the first absorption times of particles and start reactivating when reactivate=True.
Generating trajectories for each particle until END OF SIMULATION (T=714.3 or #events=inf)...
Finalizing and identifying measurement times...
Estimating blocking probability with Fleming-Viot...
C:\ProgramData\Anaconda\Anaconda3\lib\site-packages\matplotlib\pyplot.py:528: RuntimeWarning: More than 20 figures have been opened. Figures created through
the pyplot interface (`matplotlib.pyplot.figure`) are retained until explicitly closed and may consume too much memory. (To control this warning, see the
rcParam `figure.max_open_warning`).
  max_open_warning, RuntimeWarning)
        --> Number of observations for P(T>t) estimation from FV simulation: 800 (N=800)
execution time: 1515.3 sec, 25.3 min
```

```
        --> Running Monte-Carlo estimation...
        Step 1 of 1: Estimating the blocking probability by Monte-Carlo (seed=1719)...
Range of particle indices to simulate with start state #8 out of 15: [0, 0] (n=1, n/N=1.0, p=0.069744, diff=13.3%, state=[1, 2, 1])
simulate: Generating trajectories for each particle until first absorption...
--> so that we can sort ALL the first absorption times of particles and start reactivating when reactivate=True.
Generating trajectories for each particle until END OF SIMULATION (T=1714285.7 or #events=1928253)...
Finalizing and identifying measurement times...
P=0: Blocking time BEFORE removal: t=849.850, n=1744
P=0: Blocking time AFTER removal: t=849.850, n=1744
Estimating blocking probability with Monte-Carlo...
        --> Number of observations for Pr(K) estimation: 235148 (37.6% of simulation time T=1714285.7)
execution time: 4946.2 sec, 82.4 min
execution time MC + FV: 6463.3 sec, 107.7 min
        P(K) by MC: 0.131885% (simulation time = 1714285.7)
        P(K) estimated by FV: 0.140362%, E(T) = 5.0 (simulation time = 714.3)
        True P(K): 0.124693%



        Replication 2 of 5...

        --> Running Fleming-Viot estimation...
        Running Fleming-Viot simulation using an ABSORPTION start state to estimate blocking probability (seed=1727)...
Range of particle indices to simulate with start state #1 out of 10: [0, 38] (n=39, n/N=0.04875, p=0.046630, diff=0.0%, state=[3, 0, 0])
Range of particle indices to simulate with start state #2 out of 10: [39, 102] (n=64, n/N=0.08, p=0.087432, diff=-0.1%, state=[2, 1, 0])
Range of particle indices to simulate with start state #3 out of 10: [103, 146] (n=44, n/N=0.055, p=0.040801, diff=0.3%, state=[2, 0, 1])
Range of particle indices to simulate with start state #4 out of 10: [147, 291] (n=145, n/N=0.18125, p=0.163934, diff=0.1%, state=[1, 2, 0])
Range of particle indices to simulate with start state #5 out of 10: [292, 346] (n=55, n/N=0.06875, p=0.076503, diff=-0.1%, state=[1, 1, 1])
Range of particle indices to simulate with start state #6 out of 10: [347, 372] (n=26, n/N=0.0325, p=0.035701, diff=-0.1%, state=[1, 0, 2])
Range of particle indices to simulate with start state #7 out of 10: [373, 609] (n=237, n/N=0.29625, p=0.307377, diff=-0.0%, state=[0, 3, 0])
Range of particle indices to simulate with start state #8 out of 10: [610, 738] (n=129, n/N=0.16125, p=0.143443, diff=0.1%, state=[0, 2, 1])
Range of particle indices to simulate with start state #9 out of 10: [739, 778] (n=40, n/N=0.05, p=0.066940, diff=-0.3%, state=[0, 1, 2])
Range of particle indices to simulate with start state #10 out of 10: [779, 799] (n=21, n/N=0.02625, p=0.031239, diff=-0.2%, state=[0, 0, 3])
simulate: [reactivate=True] Generating trajectories for each particle until the first ACTIVATION after the burn-in period takes place...
--> so that we can start the FV procedure.
simulate: Generating trajectories for each particle until first absorption...
--> so that we can sort ALL the first absorption times of particles and start reactivating when reactivate=True.
Generating trajectories for each particle until END OF SIMULATION (T=714.3 or #events=inf)...
Finalizing and identifying measurement times...
Estimating blocking probability with Fleming-Viot...
        --> Number of observations for P(T>t) estimation from FV simulation: 800 (N=800)
execution time: 1658.1 sec, 27.6 min
        --> Running Monte-Carlo estimation...
        Step 1 of 1: Estimating the blocking probability by Monte-Carlo (seed=1729)...
Range of particle indices to simulate with start state #6 out of 15: [0, 0] (n=1, n/N=1.0, p=0.017358, diff=56.6%, state=[2, 0, 2])
simulate: Generating trajectories for each particle until first absorption...
--> so that we can sort ALL the first absorption times of particles and start reactivating when reactivate=True.
```

```
Generating trajectories for each particle until END OF SIMULATION (T=1714285.7 or #events=1925763)...
Finalizing and identifying measurement times...
P=0: Blocking time BEFORE removal: t=670.108, n=1397
P=0: [<EventType.ABSORPTION: 0>] events at time 643224.4 removed.
P=0: Blocking time AFTER removal: t=670.108, n=1397
Estimating blocking probability with Monte-Carlo...
        --> Number of observations for Pr(K) estimation: 236420 (37.5% of simulation time T=1714285.7)
execution time: 8471.3 sec, 141.2 min
execution time MC + FV: 10134.5 sec, 168.9 min
        P(K) by MC: 0.104180% (simulation time = 1714285.7)
        P(K) estimated by FV: 0.174805%, E(T) = 5.3 (simulation time = 714.3)
        True P(K): 0.124693%



        Replication 3 of 5...

        --> Running Fleming-Viot estimation...
        Running Fleming-Viot simulation using an ABSORPTION start state to estimate blocking probability (seed=1737)...
Range of particle indices to simulate with start state #1 out of 10: [0, 28] (n=29, n/N=0.03625, p=0.046630, diff=-0.2%, state=[3, 0, 0])
Range of particle indices to simulate with start state #2 out of 10: [29, 92] (n=64, n/N=0.08, p=0.087432, diff=-0.1%, state=[2, 1, 0])
Range of particle indices to simulate with start state #3 out of 10: [93, 122] (n=30, n/N=0.0375, p=0.040801, diff=-0.1%, state=[2, 0, 1])
Range of particle indices to simulate with start state #4 out of 10: [123, 262] (n=140, n/N=0.175, p=0.163934, diff=0.1%, state=[1, 2, 0])
Range of particle indices to simulate with start state #5 out of 10: [263, 325] (n=63, n/N=0.07875, p=0.076503, diff=0.0%, state=[1, 1, 1])
Range of particle indices to simulate with start state #6 out of 10: [326, 354] (n=29, n/N=0.03625, p=0.035701, diff=0.0%, state=[1, 0, 2])
Range of particle indices to simulate with start state #7 out of 10: [355, 613] (n=259, n/N=0.32375, p=0.307377, diff=0.1%, state=[0, 3, 0])
Range of particle indices to simulate with start state #8 out of 10: [614, 739] (n=126, n/N=0.1575, p=0.143443, diff=0.1%, state=[0, 2, 1])
Range of particle indices to simulate with start state #9 out of 10: [740, 777] (n=38, n/N=0.0475, p=0.066940, diff=-0.3%, state=[0, 1, 2])
Range of particle indices to simulate with start state #10 out of 10: [778, 799] (n=22, n/N=0.0275, p=0.031239, diff=-0.1%, state=[0, 0, 3])
simulate: [reactivate=True] Generating trajectories for each particle until the first ACTIVATION after the burn-in period takes place...
--> so that we can start the FV procedure.
simulate: Generating trajectories for each particle until first absorption...
--> so that we can sort ALL the first absorption times of particles and start reactivating when reactivate=True.
Generating trajectories for each particle until END OF SIMULATION (T=714.3 or #events=inf)...
Finalizing and identifying measurement times...
Estimating blocking probability with Fleming-Viot...
        --> Number of observations for P(T>t) estimation from FV simulation: 800 (N=800)
execution time: 1727.9 sec, 28.8 min
        --> Running Monte-Carlo estimation...
        Step 1 of 1: Estimating the blocking probability by Monte-Carlo (seed=1739)...
Range of particle indices to simulate with start state #11 out of 15: [0, 0] (n=1, n/N=1.0, p=0.280221, diff=2.6%, state=[0, 4, 0])
simulate: Generating trajectories for each particle until first absorption...
--> so that we can sort ALL the first absorption times of particles and start reactivating when reactivate=True.
Generating trajectories for each particle until END OF SIMULATION (T=1714285.7 or #events=1930722)...
Finalizing and identifying measurement times...
Estimating blocking probability with Monte-Carlo...
        --> Number of observations for Pr(K) estimation: 235599 (37.5% of simulation time T=1714285.7)
```

```
execution time: 14638.4 sec, 244.0 min
execution time MC + FV: 16371.2 sec, 272.9 min
        P(K) by MC: 0.133852% (simulation time = 1714285.7)
        P(K) estimated by FV: 0.175326%, E(T) = 5.6 (simulation time = 714.3)
        True P(K): 0.124693%




        Replication 4 of 5...

        --> Running Fleming-Viot estimation...
        Running Fleming-Viot simulation using an ABSORPTION start state to estimate blocking probability (seed=1747)...
Range of particle indices to simulate with start state #1 out of 10: [0, 35] (n=36, n/N=0.045, p=0.046630, diff=-0.0%, state=[3, 0, 0])
Range of particle indices to simulate with start state #2 out of 10: [36, 98] (n=63, n/N=0.07875, p=0.087432, diff=-0.1%, state=[2, 1, 0])
Range of particle indices to simulate with start state #3 out of 10: [99, 130] (n=32, n/N=0.04, p=0.040801, diff=-0.0%, state=[2, 0, 1])
Range of particle indices to simulate with start state #4 out of 10: [131, 276] (n=146, n/N=0.1825, p=0.163934, diff=0.1%, state=[1, 2, 0])
Range of particle indices to simulate with start state #5 out of 10: [277, 355] (n=79, n/N=0.09875, p=0.076503, diff=0.3%, state=[1, 1, 1])
Range of particle indices to simulate with start state #6 out of 10: [356, 388] (n=33, n/N=0.04125, p=0.035701, diff=0.2%, state=[1, 0, 2])
Range of particle indices to simulate with start state #7 out of 10: [389, 620] (n=232, n/N=0.29, p=0.307377, diff=-0.1%, state=[0, 3, 0])
Range of particle indices to simulate with start state #8 out of 10: [621, 723] (n=103, n/N=0.12875, p=0.143443, diff=-0.1%, state=[0, 2, 1])
Range of particle indices to simulate with start state #9 out of 10: [724, 777] (n=54, n/N=0.0675, p=0.066940, diff=0.0%, state=[0, 1, 2])
Range of particle indices to simulate with start state #10 out of 10: [778, 799] (n=22, n/N=0.0275, p=0.031239, diff=-0.1%, state=[0, 0, 3])
simulate: [reactivate=True] Generating trajectories for each particle until the first ACTIVATION after the burn-in period takes place...
--> so that we can start the FV procedure.
simulate: Generating trajectories for each particle until first absorption...
--> so that we can sort ALL the first absorption times of particles and start reactivating when reactivate=True.
Generating trajectories for each particle until END OF SIMULATION (T=714.3 or #events=inf)...
Finalizing and identifying measurement times...
Estimating blocking probability with Fleming-Viot...
        --> Number of observations for P(T>t) estimation from FV simulation: 800 (N=800)
execution time: 1584.3 sec, 26.4 min
        --> Running Monte-Carlo estimation...
        Step 1 of 1: Estimating the blocking probability by Monte-Carlo (seed=1749)...
Range of particle indices to simulate with start state #11 out of 15: [0, 0] (n=1, n/N=1.0, p=0.280221, diff=2.6%, state=[0, 4, 0])
simulate: Generating trajectories for each particle until first absorption...
--> so that we can sort ALL the first absorption times of particles and start reactivating when reactivate=True.
Generating trajectories for each particle until END OF SIMULATION (T=1714285.7 or #events=1926016)...
Finalizing and identifying measurement times...
P=0: Blocking time BEFORE removal: t=881.272, n=1701
P=0: Blocking time AFTER removal: t=881.272, n=1701
Estimating blocking probability with Monte-Carlo...
        --> Number of observations for Pr(K) estimation: 235980 (37.5% of simulation time T=1714285.7)
execution time: 4776.8 sec, 79.6 min
execution time MC + FV: 6364.7 sec, 106.1 min
        P(K) by MC: 0.137243% (simulation time = 1714285.7)
        P(K) estimated by FV: 0.123088%, E(T) = 4.9 (simulation time = 714.3)
        True P(K): 0.124693%
```

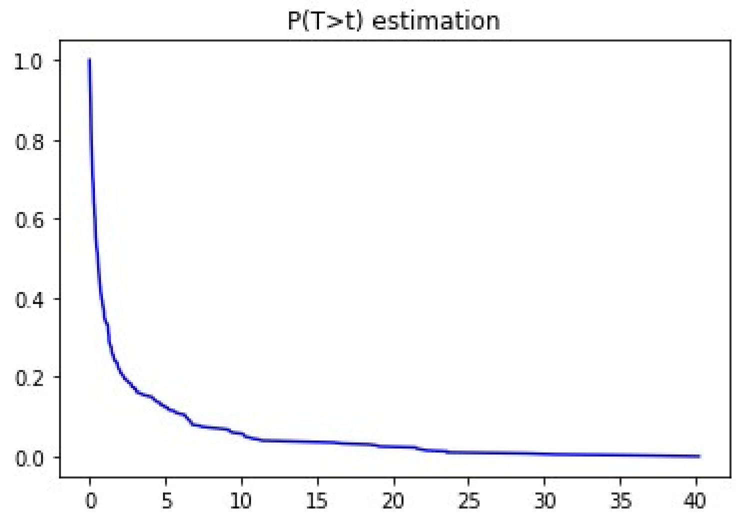
```
        Replication 5 of 5...

        --> Running Fleming-Viot estimation...
        Running Fleming-Viot simulation using an ABSORPTION start state to estimate blocking probability (seed=1757)...
Range of particle indices to simulate with start state #1 out of 10: [0, 38] (n=39, n/N=0.04875, p=0.046630, diff=0.0%, state=[3, 0, 0])
Range of particle indices to simulate with start state #2 out of 10: [39, 113] (n=75, n/N=0.09375, p=0.087432, diff=0.1%, state=[2, 1, 0])
Range of particle indices to simulate with start state #3 out of 10: [114, 141] (n=28, n/N=0.035, p=0.040801, diff=-0.1%, state=[2, 0, 1])
Range of particle indices to simulate with start state #4 out of 10: [142, 281] (n=140, n/N=0.175, p=0.163934, diff=0.1%, state=[1, 2, 0])
Range of particle indices to simulate with start state #5 out of 10: [282, 336] (n=55, n/N=0.06875, p=0.076503, diff=-0.1%, state=[1, 1, 1])
Range of particle indices to simulate with start state #6 out of 10: [337, 362] (n=26, n/N=0.0325, p=0.035701, diff=-0.1%, state=[1, 0, 2])
Range of particle indices to simulate with start state #7 out of 10: [363, 597] (n=235, n/N=0.29375, p=0.307377, diff=-0.0%, state=[0, 3, 0])
Range of particle indices to simulate with start state #8 out of 10: [598, 723] (n=126, n/N=0.1575, p=0.143443, diff=0.1%, state=[0, 2, 1])
Range of particle indices to simulate with start state #9 out of 10: [724, 765] (n=42, n/N=0.0525, p=0.066940, diff=-0.2%, state=[0, 1, 2])
Range of particle indices to simulate with start state #10 out of 10: [766, 799] (n=34, n/N=0.0425, p=0.031239, diff=0.4%, state=[0, 0, 3])
simulate: [reactivate=True] Generating trajectories for each particle until the first ACTIVATION after the burn-in period takes place...
--> so that we can start the FV procedure.
simulate: Generating trajectories for each particle until first absorption...
--> so that we can sort ALL the first absorption times of particles and start reactivating when reactivate=True.
Generating trajectories for each particle until END OF SIMULATION (T=714.3 or #events=inf)...
Finalizing and identifying measurement times...
Estimating blocking probability with Fleming-Viot...
        --> Number of observations for P(T>t) estimation from FV simulation: 800 (N=800)
execution time: 1389.8 sec, 23.2 min
        --> Running Monte-Carlo estimation...
        Step 1 of 1: Estimating the blocking probability by Monte-Carlo (seed=1759)...
Range of particle indices to simulate with start state #11 out of 15: [0, 0] (n=1, n/N=1.0, p=0.280221, diff=2.6%, state=[0, 4, 0])
simulate: Generating trajectories for each particle until first absorption...
--> so that we can sort ALL the first absorption times of particles and start reactivating when reactivate=True.
Generating trajectories for each particle until END OF SIMULATION (T=1714285.7 or #events=1924182)...
Finalizing and identifying measurement times...
Estimating blocking probability with Monte-Carlo...
        --> Number of observations for Pr(K) estimation: 234050 (37.4% of simulation time T=1714285.7)
execution time: 4101.6 sec, 68.4 min
execution time MC + FV: 5494.1 sec, 91.6 min
        P(K) by MC: 0.115072% (simulation time = 1714285.7)
        P(K) estimated by FV: 0.055317%, E(T) = 4.5 (simulation time = 714.3)
        True P(K): 0.124693%
Results:
    K BSA    N replication    Pr(MC)       Time(MC) #Events(MC) #Cycles(MC)  \
1  20   4  400           1  0.001194  321546.015846      963036      116008
1  20   4  400           2  0.000975  321879.831934      963715      118506
1  20   4  400           3  0.001353  321728.304065      964423      117654
1  20   4  400           4  0.001523  321438.783784      964856      118326
1  20   4  400           5  0.000991  321942.989753      965164      117640
```

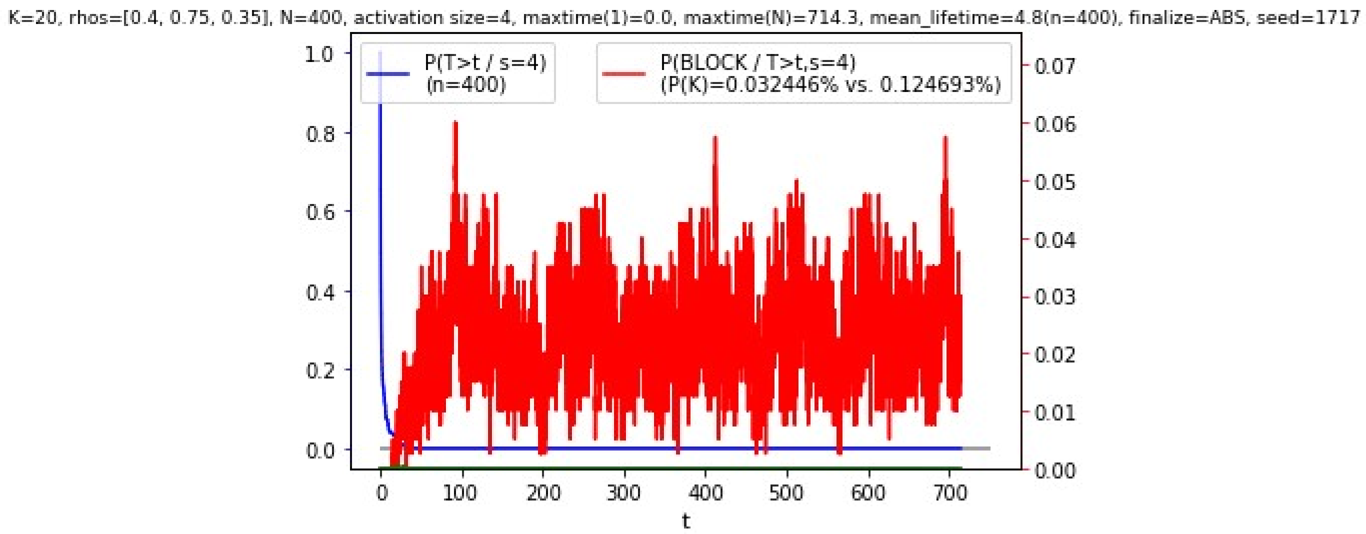
```
2  20   4  800           1  0.001319  644387.718386     1928253      235148
2  20   4  800           2  0.001042  643223.711530     1925763      236420
2  20   4  800           3  0.001339  643641.480125     1930722      235599
2  20   4  800           4  0.001372  642126.055731     1926016      235980
2  20   4  800           5  0.001151  640915.741372     1924182      234050

       E(T) #Cycles(E(T))    Pr(FV)       Time(FV) #Events(FV) #Samples(S(t))  \
1  4.832810           400  0.000324  285714.285714      963036            400
1  4.937839           400  0.000706  285714.285714      963715            400
1  4.631286           400  0.000202  285714.285714      964423            400
1  5.189424           400  0.000496  285714.285714      964856            400
1  5.682567           400  0.001663  285714.285714      965164            400
2  4.973548           800  0.001404  571428.571429     1928253            800
2  5.305331           800  0.001748  571428.571429     1925763            800
2  5.640332           800  0.001753  571428.571429     1930722            800
2  4.928748           800  0.001231  571428.571429     1926016            800
2  4.475487           800  0.000553  571428.571429     1924182            800

      Pr(K)  seed     exec_time
1  0.001247  1719   2130.731570
1  0.001247  1729   2050.486265
1  0.001247  1739   2024.931174
1  0.001247  1749   2047.680548
1  0.001247  1759   2025.490302
2  0.001247  1719   6463.332085
2  0.001247  1729  10134.535803
2  0.001247  1739  16371.232150
2  0.001247  1749   6364.677303
2  0.001247  1759   5494.124543

*** Running simulation for nparticles=1600 (3 of 3) on 5 replications...



        Replication 1 of 5...

        --> Running Fleming-Viot estimation...
        Running Fleming-Viot simulation using an ABSORPTION start state to estimate blocking probability (seed=1717)...
Range of particle indices to simulate with start state #1 out of 10: [0, 58] (n=59, n/N=0.036875, p=0.046630, diff=-0.2%, state=[3, 0, 0])
Range of particle indices to simulate with start state #2 out of 10: [59, 186] (n=128, n/N=0.08, p=0.087432, diff=-0.1%, state=[2, 1, 0])
Range of particle indices to simulate with start state #3 out of 10: [187, 240] (n=54, n/N=0.03375, p=0.040801, diff=-0.2%, state=[2, 0, 1])
Range of particle indices to simulate with start state #4 out of 10: [241, 509] (n=269, n/N=0.168125, p=0.163934, diff=0.0%, state=[1, 2, 0])
Range of particle indices to simulate with start state #5 out of 10: [510, 633] (n=124, n/N=0.0775, p=0.076503, diff=0.0%, state=[1, 1, 1])
Range of particle indices to simulate with start state #6 out of 10: [634, 690] (n=57, n/N=0.035625, p=0.035701, diff=-0.0%, state=[1, 0, 2])
Range of particle indices to simulate with start state #7 out of 10: [691, 1176] (n=486, n/N=0.30375, p=0.307377, diff=-0.0%, state=[0, 3, 0])
Range of particle indices to simulate with start state #8 out of 10: [1177, 1426] (n=250, n/N=0.15625, p=0.143443, diff=0.1%, state=[0, 2, 1])
Range of particle indices to simulate with start state #9 out of 10: [1427, 1544] (n=118, n/N=0.07375, p=0.066940, diff=0.1%, state=[0, 1, 2])
```

```
Range of particle indices to simulate with start state #10 out of 10: [1545, 1599] (n=55, n/N=0.034375, p=0.031239, diff=0.1%, state=[0, 0, 3])
simulate: [reactivate=True] Generating trajectories for each particle until the first ACTIVATION after the burn-in period takes place...
--> so that we can start the FV procedure.
simulate: Generating trajectories for each particle until first absorption...
--> so that we can sort ALL the first absorption times of particles and start reactivating when reactivate=True.
Generating trajectories for each particle until END OF SIMULATION (T=714.3 or #events=inf)...
Finalizing and identifying measurement times...
Estimating blocking probability with Fleming-Viot...
        --> Number of observations for P(T>t) estimation from FV simulation: 1600 (N=1600)
execution time: 2783.7 sec, 46.4 min
        --> Running Monte-Carlo estimation...
        Step 1 of 1: Estimating the blocking probability by Monte-Carlo (seed=1719)...
Range of particle indices to simulate with start state #8 out of 15: [0, 0] (n=1, n/N=1.0, p=0.069744, diff=13.3%, state=[1, 2, 1])
simulate: Generating trajectories for each particle until first absorption...
--> so that we can sort ALL the first absorption times of particles and start reactivating when reactivate=True.
Generating trajectories for each particle until END OF SIMULATION (T=3428571.4 or #events=3850457)...
Finalizing and identifying measurement times...
P=0: Blocking time BEFORE removal: t=1497.922, n=3096
P=0: [<EventType.ABSORPTION: 0>] events at time 1286491.0 removed.
P=0: Blocking time AFTER removal: t=1497.922, n=3096
Estimating blocking probability with Monte-Carlo...
        --> Number of observations for Pr(K) estimation: 471780 (37.5% of simulation time T=3428571.4)
execution time: 14823.1 sec, 247.1 min
execution time MC + FV: 17609.7 sec, 293.5 min
        P(K) by MC: 0.116435% (simulation time = 3428571.4)
        P(K) estimated by FV: 0.116679%, E(T) = 5.1 (simulation time = 714.3)
        True P(K): 0.124693%



        Replication 2 of 5...

        --> Running Fleming-Viot estimation...
        Running Fleming-Viot simulation using an ABSORPTION start state to estimate blocking probability (seed=1727)...
Range of particle indices to simulate with start state #1 out of 10: [0, 83] (n=84, n/N=0.0525, p=0.046630, diff=0.1%, state=[3, 0, 0])
Range of particle indices to simulate with start state #2 out of 10: [84, 217] (n=134, n/N=0.08375, p=0.087432, diff=-0.0%, state=[2, 1, 0])
Range of particle indices to simulate with start state #3 out of 10: [218, 307] (n=90, n/N=0.05625, p=0.040801, diff=0.4%, state=[2, 0, 1])
Range of particle indices to simulate with start state #4 out of 10: [308, 583] (n=276, n/N=0.1725, p=0.163934, diff=0.1%, state=[1, 2, 0])
Range of particle indices to simulate with start state #5 out of 10: [584, 698] (n=115, n/N=0.071875, p=0.076503, diff=-0.1%, state=[1, 1, 1])
Range of particle indices to simulate with start state #6 out of 10: [699, 752] (n=54, n/N=0.03375, p=0.035701, diff=-0.1%, state=[1, 0, 2])
Range of particle indices to simulate with start state #7 out of 10: [753, 1213] (n=461, n/N=0.288125, p=0.307377, diff=-0.1%, state=[0, 3, 0])
Range of particle indices to simulate with start state #8 out of 10: [1214, 1462] (n=249, n/N=0.155625, p=0.143443, diff=0.1%, state=[0, 2, 1])
Range of particle indices to simulate with start state #9 out of 10: [1463, 1557] (n=95, n/N=0.059375, p=0.066940, diff=-0.1%, state=[0, 1, 2])
Range of particle indices to simulate with start state #10 out of 10: [1558, 1599] (n=42, n/N=0.02625, p=0.031239, diff=-0.2%, state=[0, 0, 3])
simulate: [reactivate=True] Generating trajectories for each particle until the first ACTIVATION after the burn-in period takes place...
--> so that we can start the FV procedure.
simulate: Generating trajectories for each particle until first absorption...
```

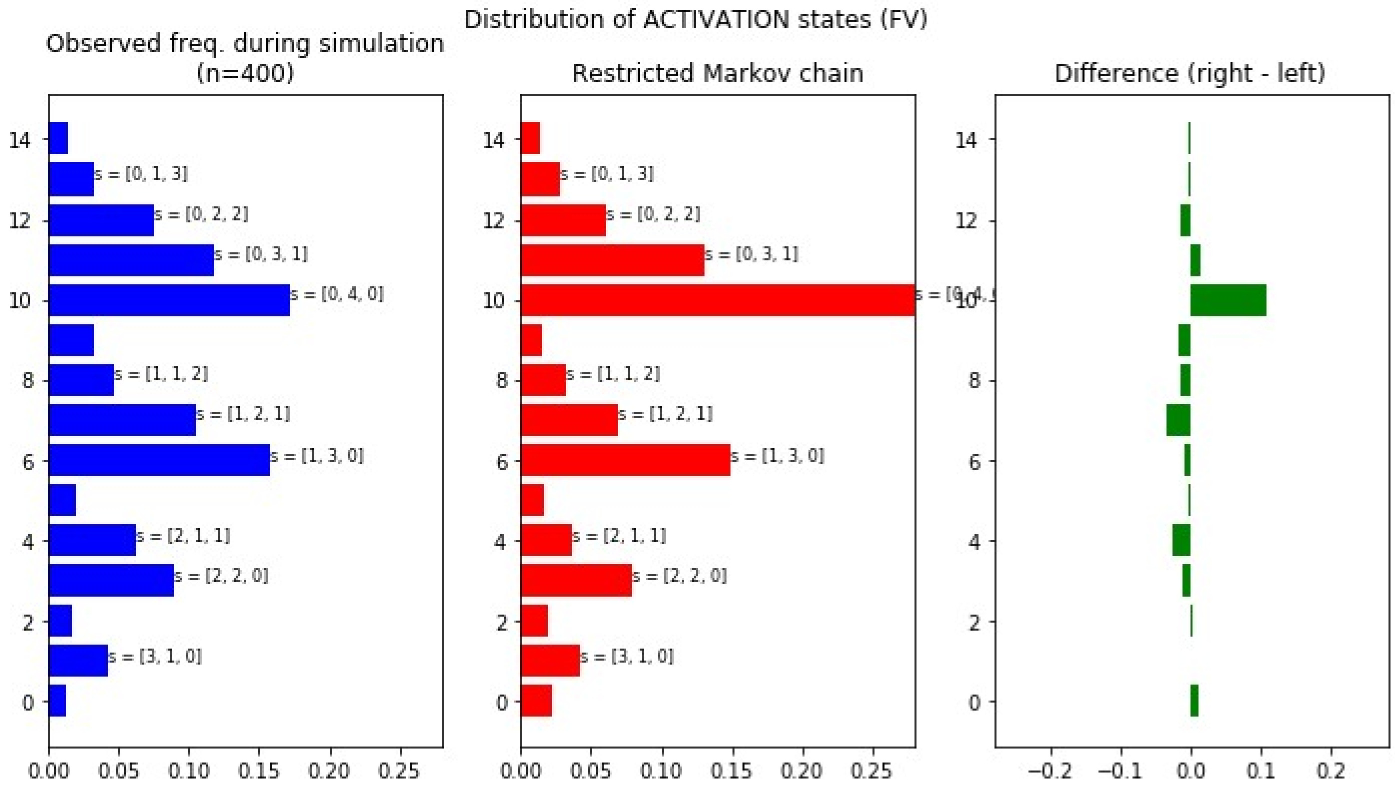
```
--> so that we can sort ALL the first absorption times of particles and start reactivating when reactivate=True.
Generating trajectories for each particle until END OF SIMULATION (T=714.3 or #events=inf)...
Finalizing and identifying measurement times...
Estimating blocking probability with Fleming-Viot...
        --> Number of observations for P(T>t) estimation from FV simulation: 1600 (N=1600)
execution time: 2769.9 sec, 46.2 min
        --> Running Monte-Carlo estimation...
        Step 1 of 1: Estimating the blocking probability by Monte-Carlo (seed=1729)...
Range of particle indices to simulate with start state #6 out of 15: [0, 0] (n=1, n/N=1.0, p=0.017358, diff=56.6%, state=[2, 0, 2])
simulate: Generating trajectories for each particle until first absorption...
--> so that we can sort ALL the first absorption times of particles and start reactivating when reactivate=True.
Generating trajectories for each particle until END OF SIMULATION (T=3428571.4 or #events=3854199)...
Finalizing and identifying measurement times...
P=0: Blocking time BEFORE removal: t=1365.774, n=2817
P=0: [<EventType.ABSORPTION: 0>] events at time 1286868.5 removed.
P=0: Blocking time AFTER removal: t=1365.774, n=2817
Traceback (most recent call last):

  File "<ipython-input-1-cc767213348a>", line 1, in <module>
    runfile('E:/Daniel/Projects/PhD-RL-Toulouse/projects/Python/test/test_QB.py', wdir='E:/Daniel/Projects/PhD-RL-Toulouse/projects/Python/test')

  File "C:\ProgramData\Anaconda\Anaconda3\lib\site-packages\spyder\utils\site\sitecustomize.py", line 705, in runfile
    execfile(filename, namespace)

  File "C:\ProgramData\Anaconda\Anaconda3\lib\site-packages\spyder\utils\site\sitecustomize.py", line 102, in execfile
    exec(compile(f.read(), filename, 'exec'), namespace)

  File "E:/Daniel/Projects/PhD-RL-Toulouse/projects/Python/test/test_QB.py", line 1723, in <module>
    results, results_agg, est_mc, est_fv, est_abs, est_surv, ax_mc, ax_fv = Test_QB_Particles.test_fv_implementation(nservers=3, K=20,
buffer_size_activation=0.2, burnin_cycles_absorption=5)

  File "E:/Daniel/Projects/PhD-RL-Toulouse/projects/Python/test/test_QB.py", line 559, in test_fv_implementation
    est_mc, dict_stats_mc = estimators.estimate_blocking_mc(env_queue, dict_params_simul, dict_params_info=dict_params_info)

  File "E:\Daniel\Projects\PhD-RL-Toulouse\projects\Python\lib\estimators.py", line 4235, in estimate_blocking_mc
    proba_blocking_mc, _, total_return_time, n_return_observations = est_mc.simulate(EventType.ACTIVATION)

  File "E:\Daniel\Projects\PhD-RL-Toulouse\projects\Python\lib\estimators.py", line 880, in simulate
    time_start, time1, time2, time3 = self.run_simulation()

  File "E:\Daniel\Projects\PhD-RL-Toulouse\projects\Python\lib\estimators.py", line 1032, in run_simulation
    self.compute_counts()

  File "E:\Daniel\Projects\PhD-RL-Toulouse\projects\Python\lib\estimators.py", line 2740, in compute_counts
    self.insert_relative_time_from_activation_to_absorption(t, activation_times, event_types)

  File "E:\Daniel\Projects\PhD-RL-Toulouse\projects\Python\lib\estimators.py", line 2947, in insert_relative_time_from_activation_to_absorption
    self._update_counts_alive(idx_insort, event_types)
```

```
  File "E:\Daniel\Projects\PhD-RL-Toulouse\projects\Python\lib\estimators.py", line 2995, in _update_counts_alive
    self.counts_alive[idx] += 1

KeyboardInterrupt
```

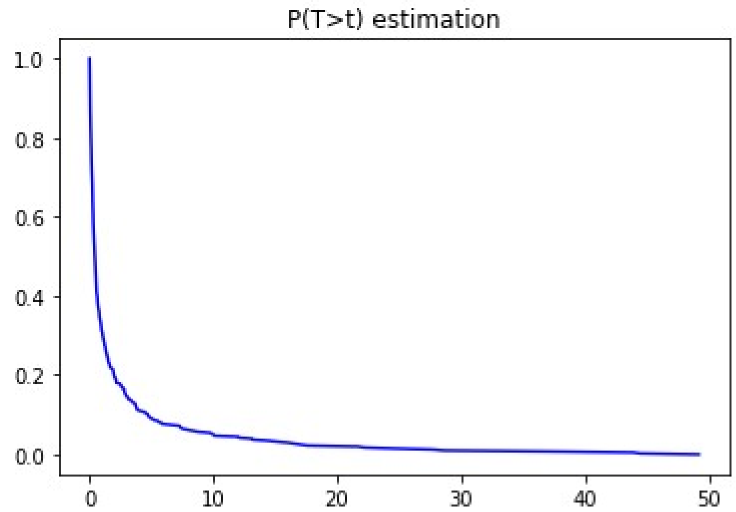




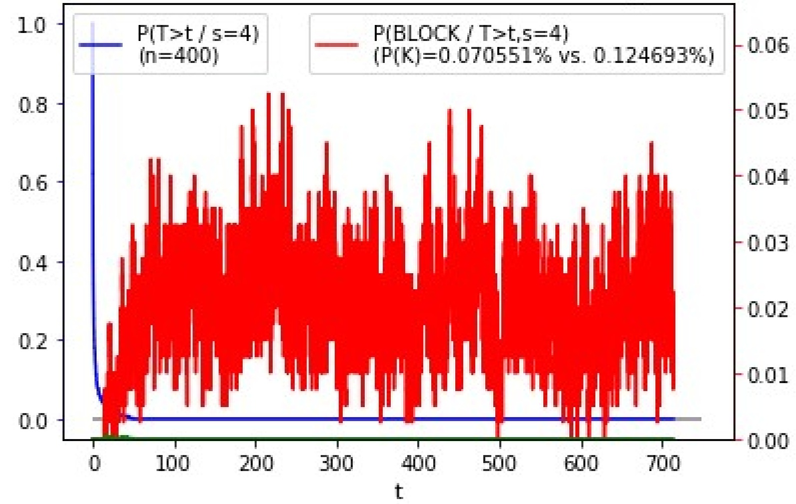
<matplotlib.figure.Figure at 0x1dbca94c278>



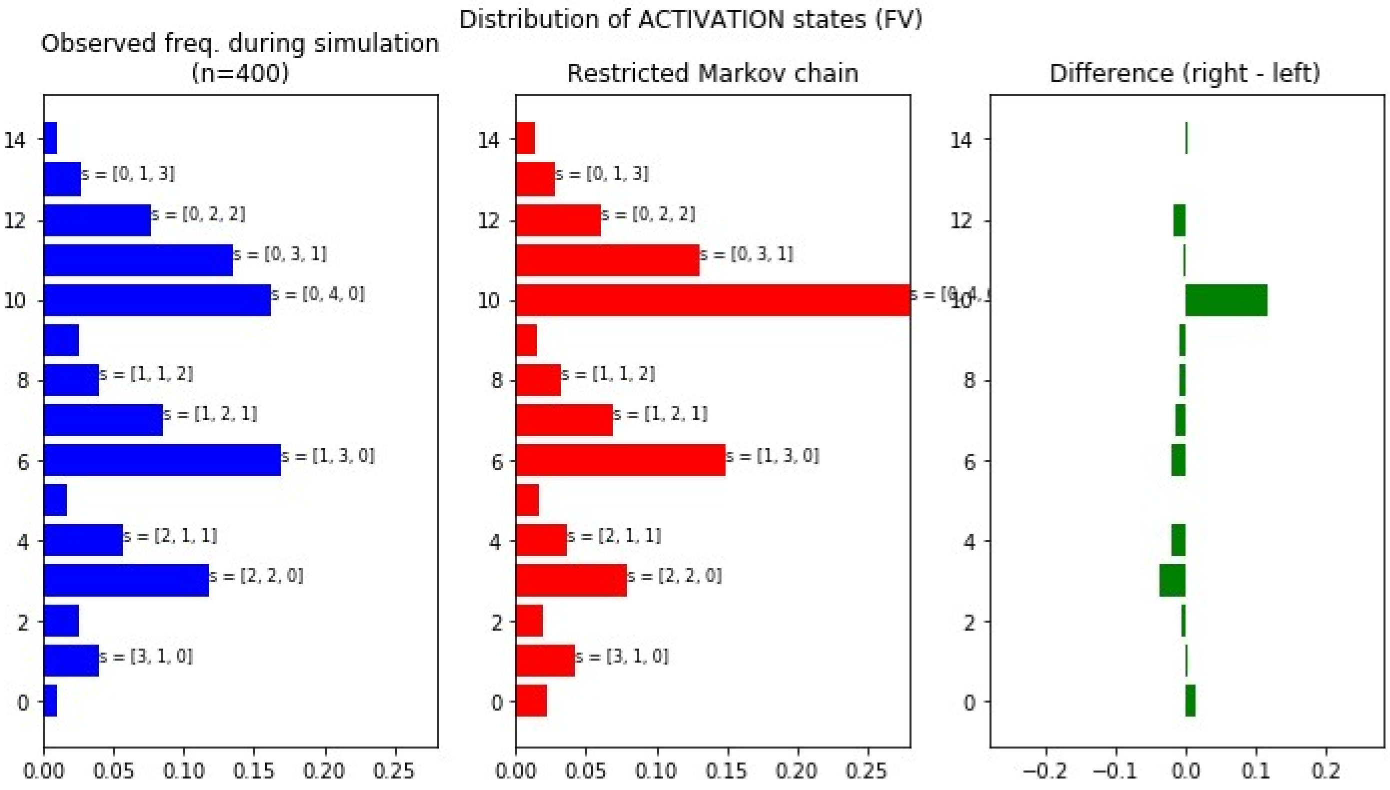
Distribution of ACTIVATION states (FV)
Observed freq. during simulation (n=400)
Restricted Markov chain
Difference (right - left)
s = [0, 1, 3]
s = [0, 2, 2]
s = [0, 3, 1]
s = [0, 4, 0]
s = [1, 1, 2]
s = [1, 2, 1]
s = [1, 3, 0]
s = [2, 1, 1]
s = [2, 2, 0]
s = [3, 1, 0]



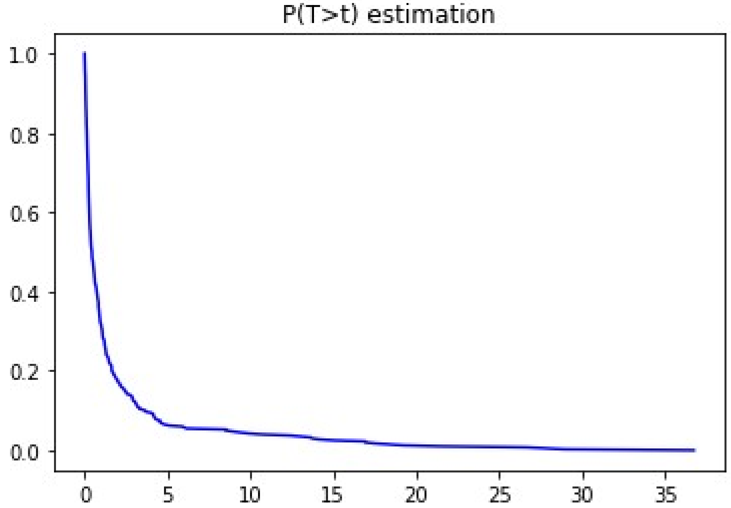
K=20, rhos=[0.4, 0.75, 0.35], N=400, activation size=4, maxtime(1)=0.0, maxtime(N)=714.3, mean_lifetime=4.9(n=400), finalize=ABS, seed=1727



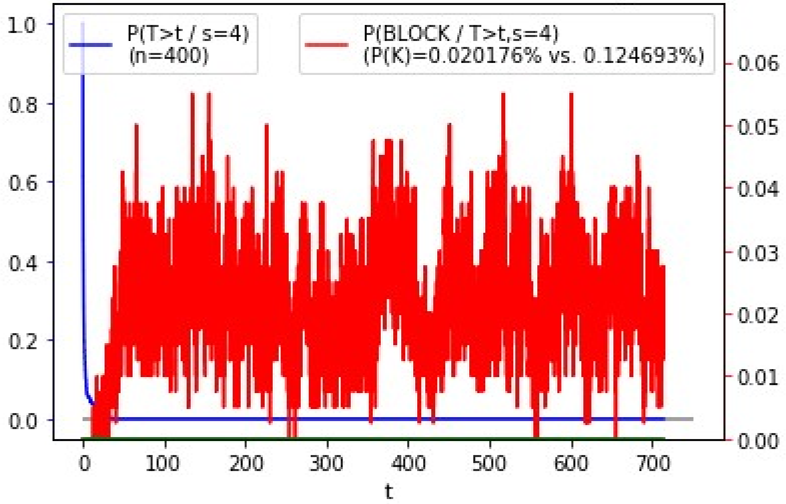

```
<matplotlib.figure.Figure at 0x1dbe9987048>
```



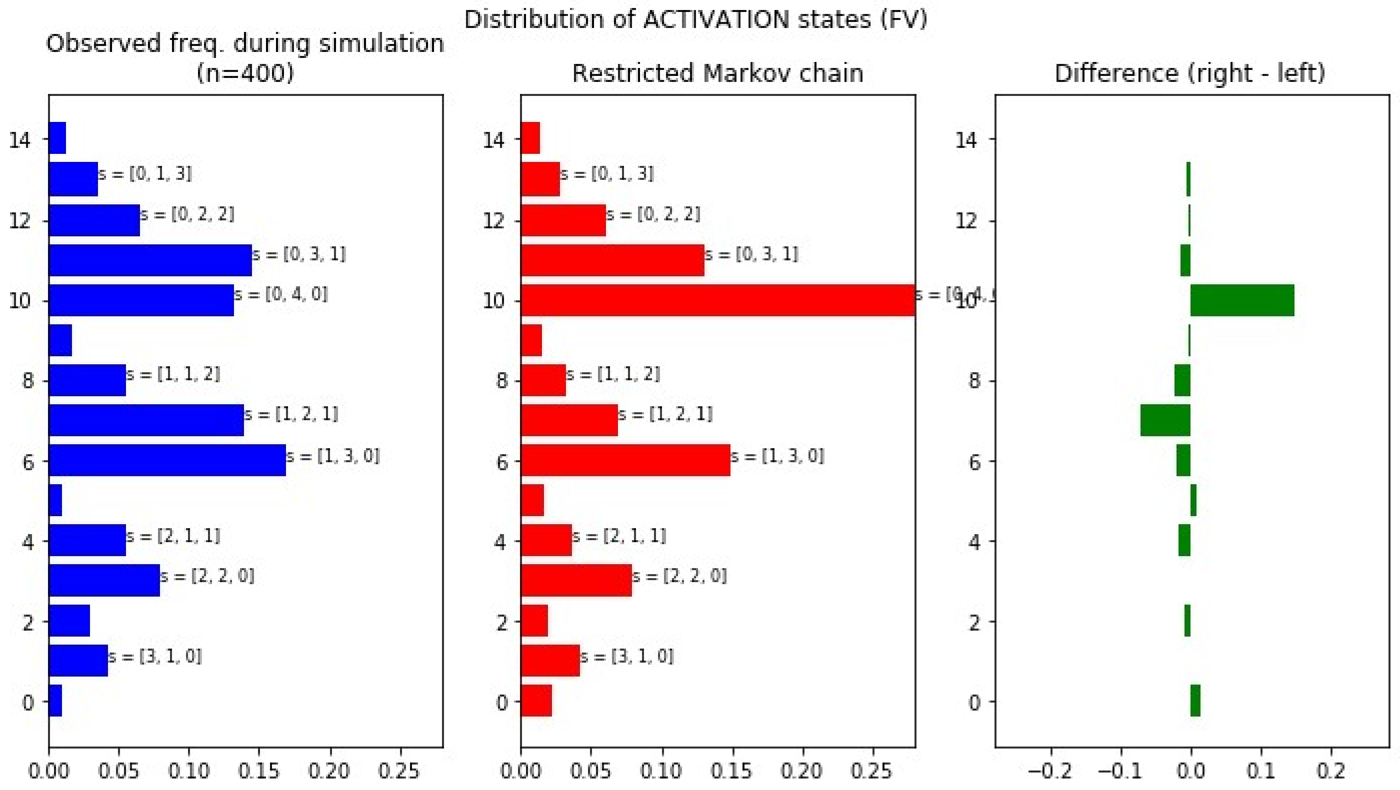
Distribution of ACTIVATION states (FV)
Observed freq. during simulation (n=400)
Restricted Markov chain
Difference (right - left)
s = [0, 1, 3]
s = [0, 2, 2]
s = [0, 3, 1]
s = [0, 4, 0]
s = [1, 1, 2]
s = [1, 2, 1]
s = [1, 3, 0]
s = [2, 1, 1]
s = [2, 2, 0]
s = [3, 1, 0]
0.00 0.05 0.10 0.15 0.20 0.25
−0.2 −0.1 0.0 0.1 0.2
0 2 4 6 8 10 12 14



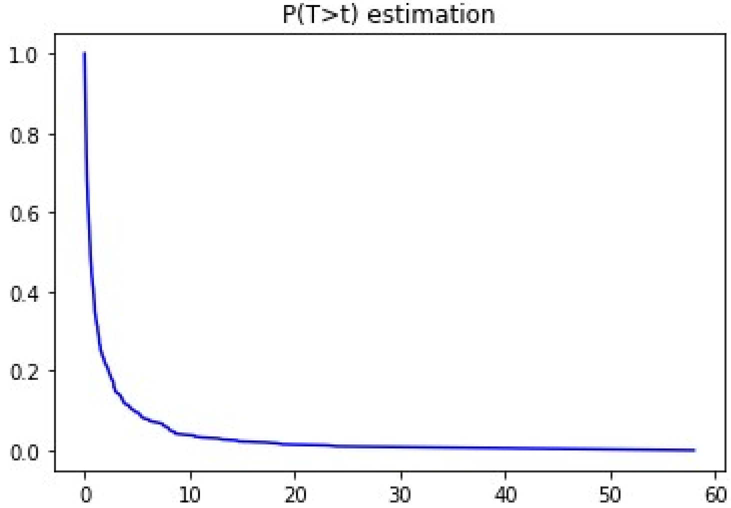
K=20, rhos=[0.4, 0.75, 0.35], N=400, activation size=4, maxtime(1)=0.0, maxtime(N)=714.3, mean_lifetime=4.6(n=400), finalize=ABS, seed=1737



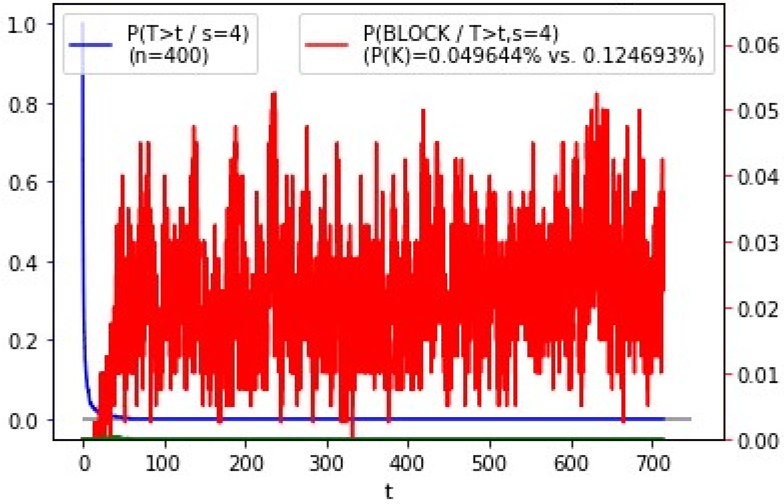
<matplotlib.figure.Figure at 0x1dbd67ba630>



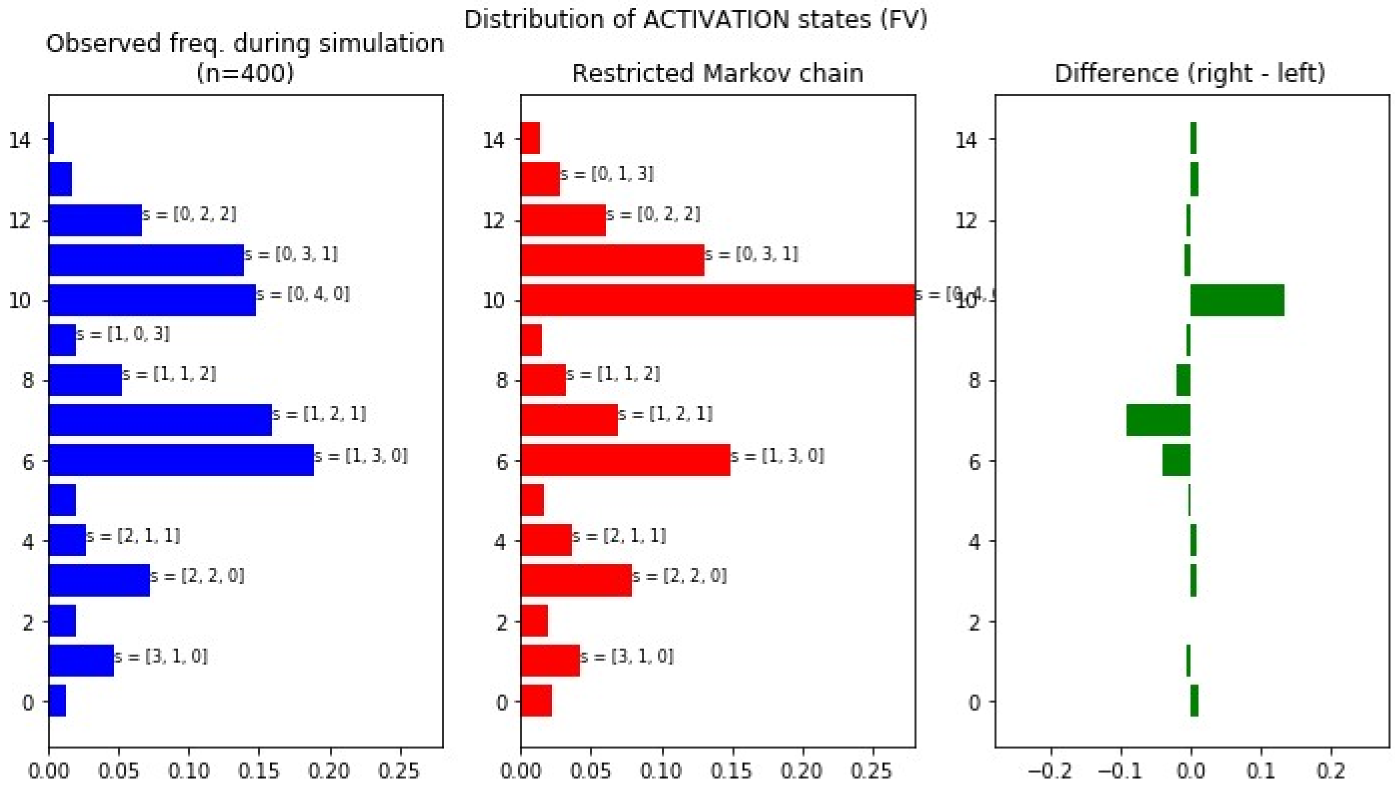
Distribution of ACTIVATION states (FV)
Observed freq. during simulation (n=400)
Restricted Markov chain
Difference (right - left)
s = [0, 1, 3]
s = [0, 2, 2]
s = [0, 3, 1]
s = [0, 4, 0]
s = [1, 1, 2]
s = [1, 2, 1]
s = [1, 3, 0]
s = [2, 1, 1]
s = [2, 2, 0]
s = [3, 1, 0]



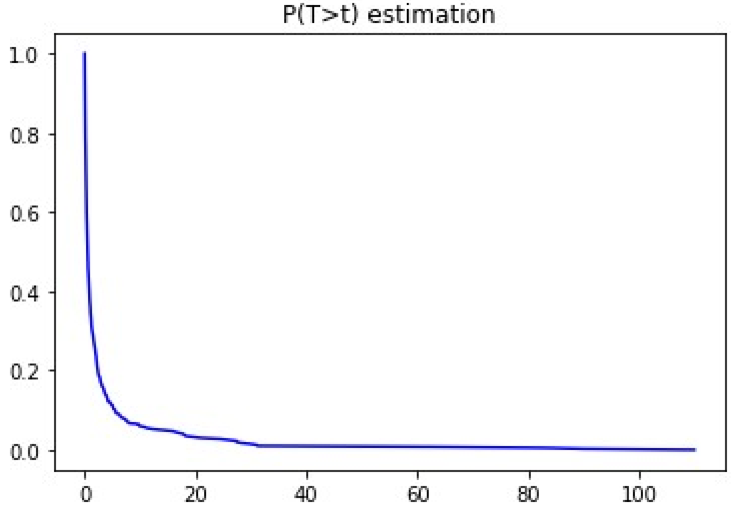
K=20, rhos=[0.4, 0.75, 0.35], N=400, activation size=4, maxtime(1)=0.0, maxtime(N)=714.3, mean_lifetime=5.2(n=400), finalize=ABS, seed=1747



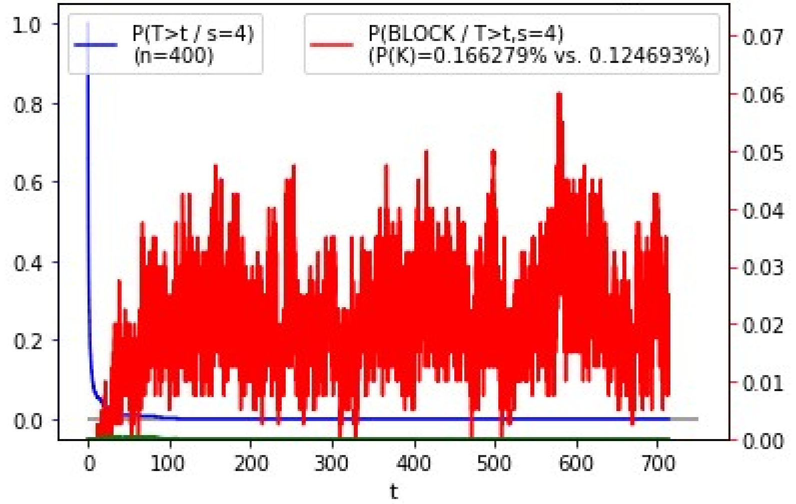

```
<matplotlib.figure.Figure at 0x1dbc811f470>
```



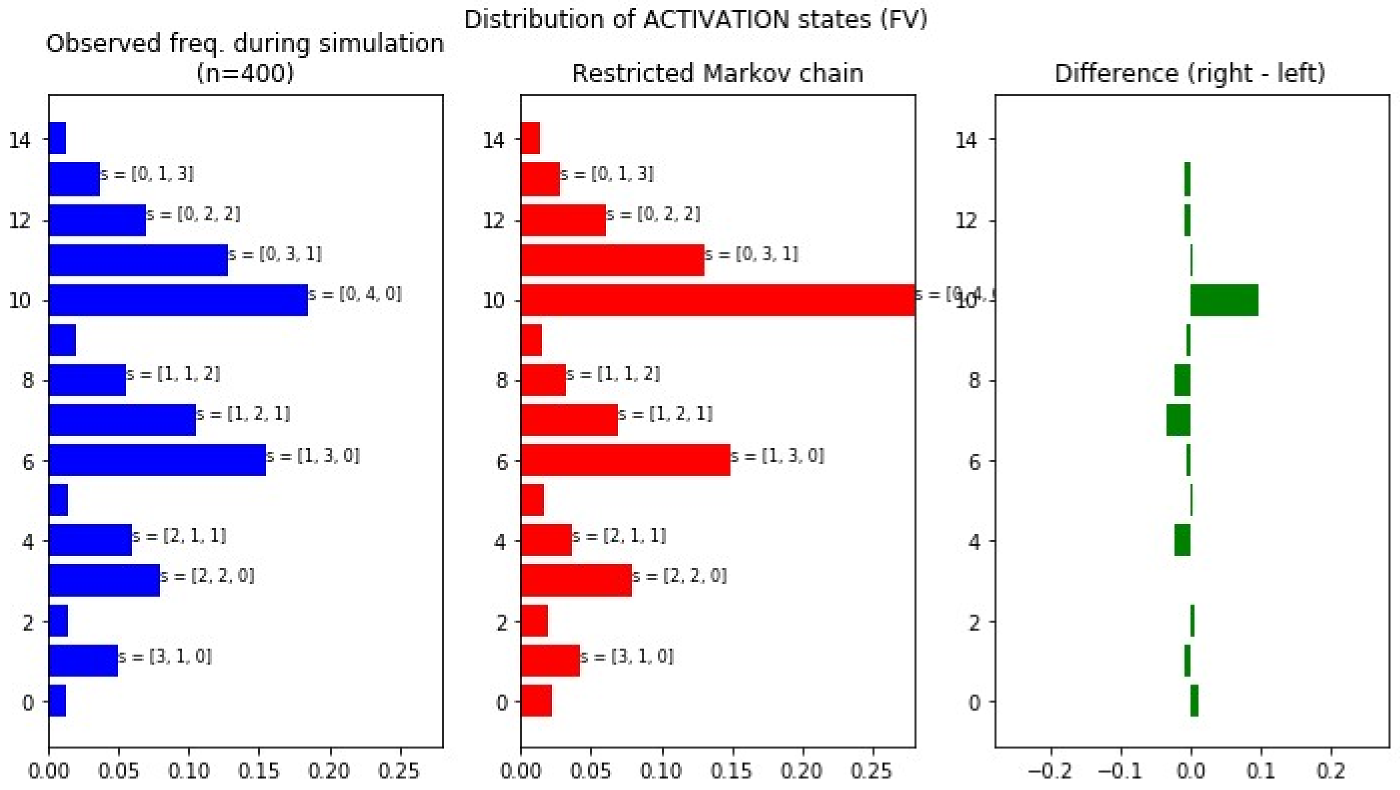
Distribution of ACTIVATION states (FV)
Observed freq. during simulation (n=400)
Restricted Markov chain
Difference (right - left)
s = [0, 2, 2]
s = [0, 3, 1]
s = [0, 4, 0]
s = [1, 0, 3]
s = [1, 1, 2]
s = [1, 2, 1]
s = [1, 3, 0]
s = [2, 1, 1]
s = [2, 2, 0]
s = [3, 1, 0]
s = [0, 1, 3]

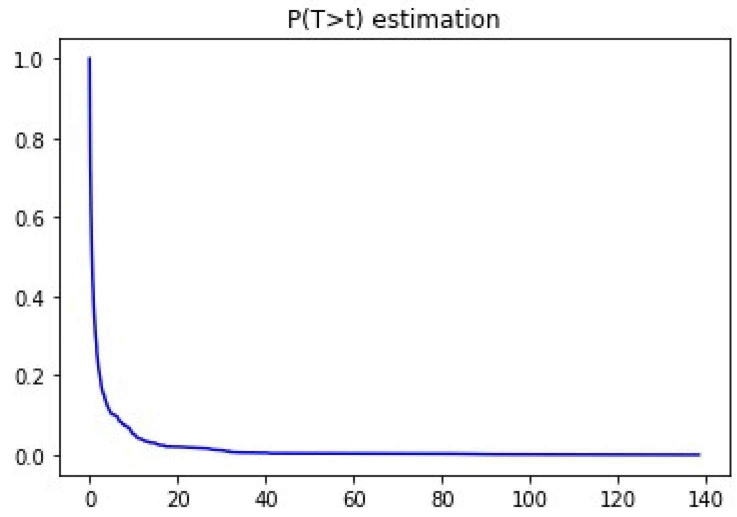


K=20, rhos=[0.4, 0.75, 0.35], N=400, activation size=4, maxtime(1)=0.0, maxtime(N)=714.3, mean_lifetime=5.7(n=400), finalize=ABS, seed=1757

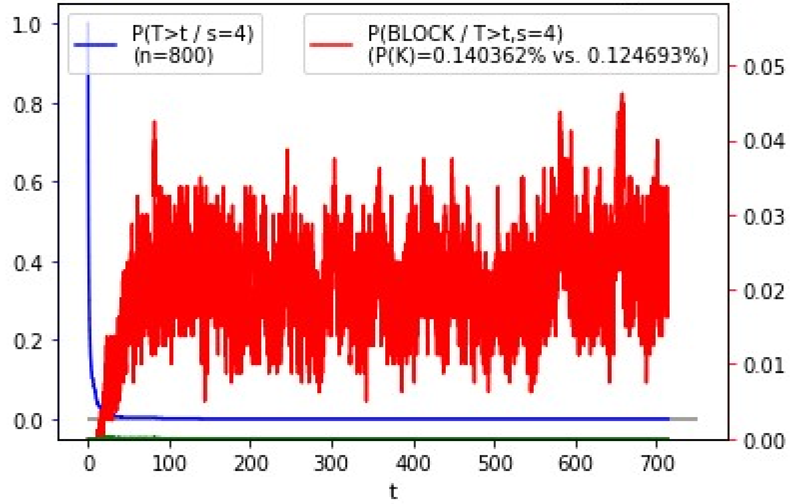



```
<matplotlib.figure.Figure at 0x1dbe23e0780>
```

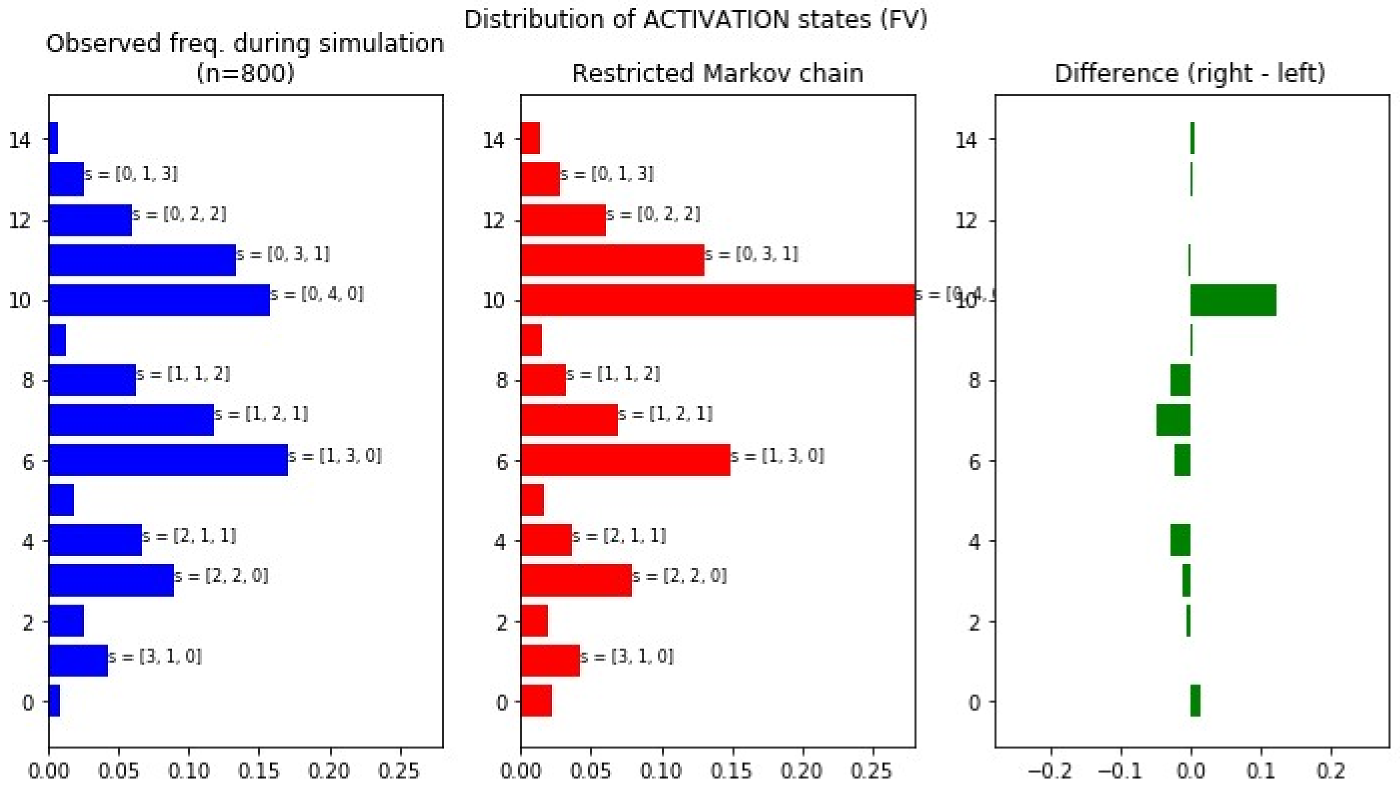

Distribution of ACTIVATION states (FV)
Observed freq. during simulation (n=400)
Restricted Markov chain
Difference (right - left)
s = [0, 1, 3]
s = [0, 2, 2]
s = [0, 3, 1]
s = [0, 4, 0]
s = [1, 1, 2]
s = [1, 2, 1]
s = [1, 3, 0]
s = [2, 1, 1]
s = [2, 2, 0]
s = [3, 1, 0]
0.00 0.05 0.10 0.15 0.20 0.25
−0.2 −0.1 0.0 0.1 0.2
0 2 4 6 8 10 12 14



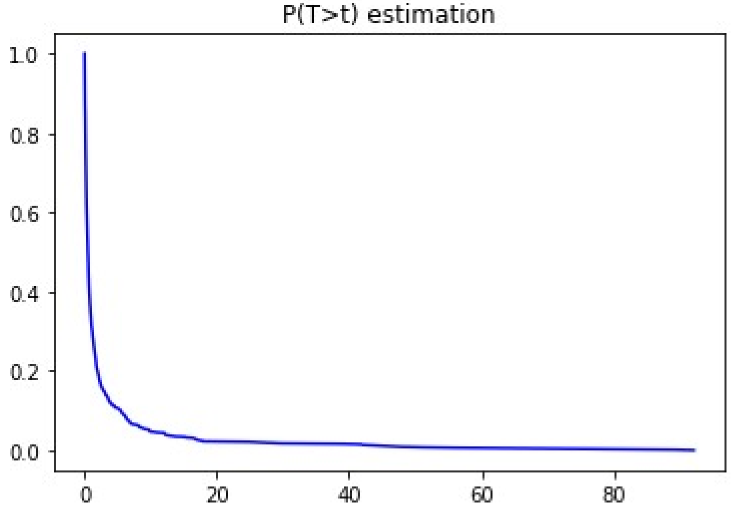
K=20, rhos=[0.4, 0.75, 0.35], N=800, activation size=4, maxtime(1)=0.0, maxtime(N)=714.3, mean_lifetime=5.0(n=800), finalize=ABS, seed=1717



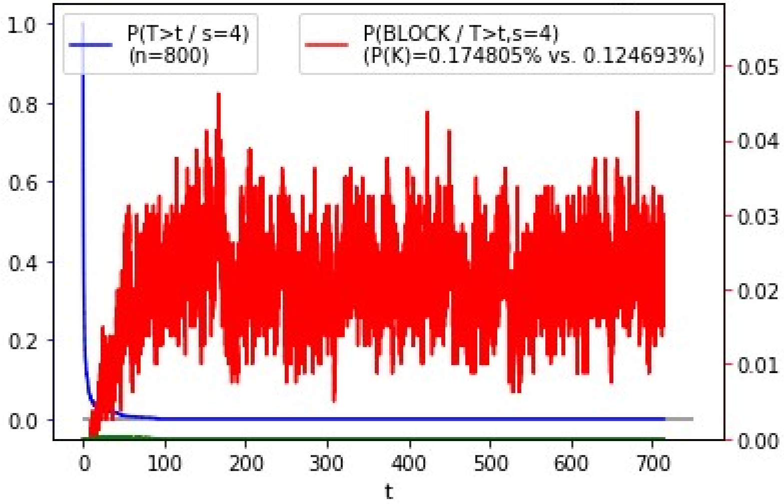
<matplotlib.figure.Figure at 0x1dbfa588518>



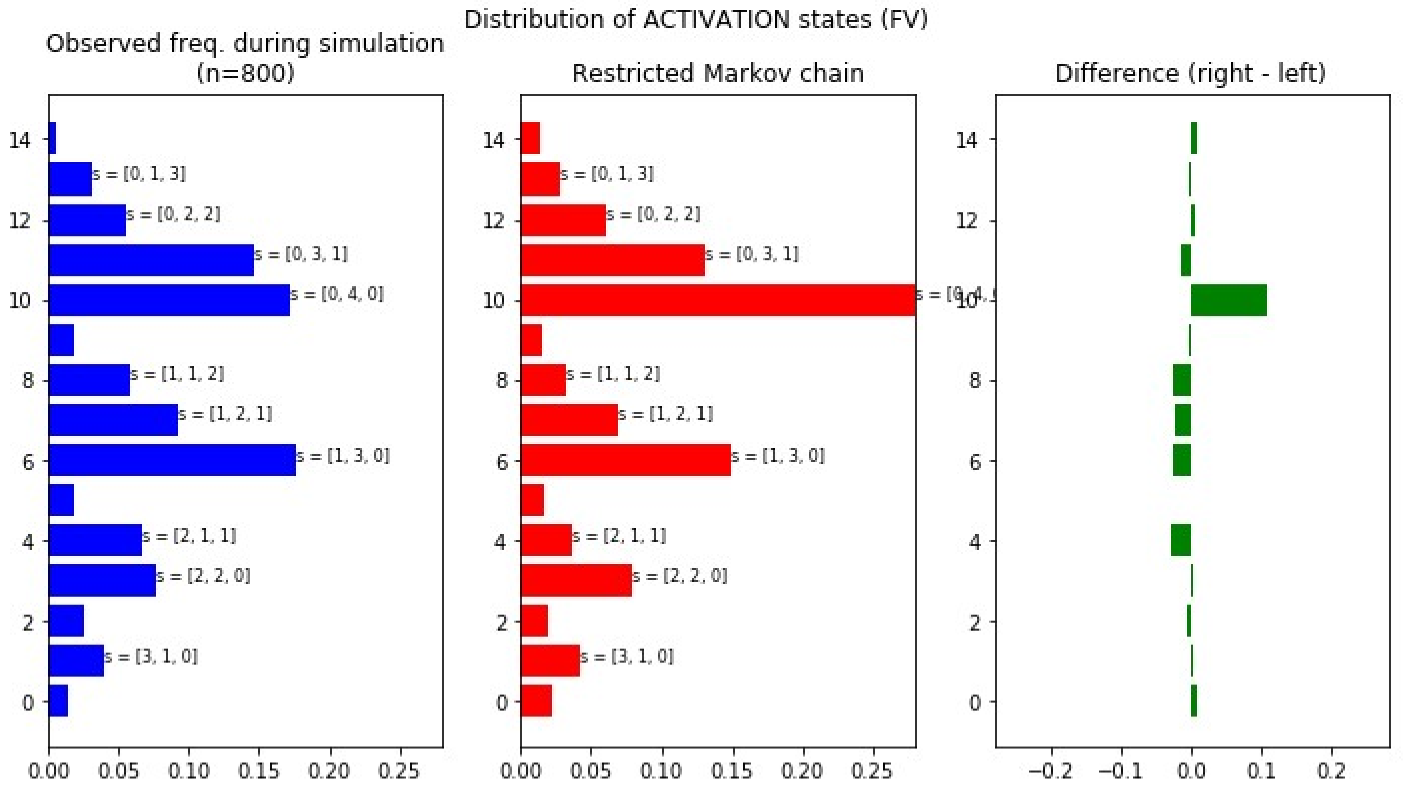
Distribution of ACTIVATION states (FV)
Observed freq. during simulation
(n=800)
Restricted Markov chain
Difference (right - left)
s = [0, 1, 3]
s = [0, 2, 2]
s = [0, 3, 1]
s = [0, 4, 0]
s = [1, 1, 2]
s = [1, 2, 1]
s = [1, 3, 0]
s = [2, 1, 1]
s = [2, 2, 0]
s = [3, 1, 0]



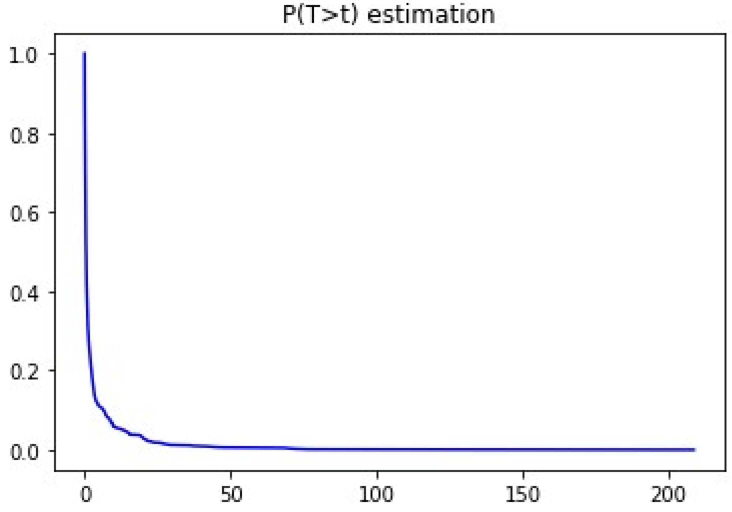
K=20, rhos=[0.4, 0.75, 0.35], N=800, activation size=4, maxtime(1)=0.0, maxtime(N)=714.3, mean_lifetime=5.3(n=800), finalize=ABS, seed=1727



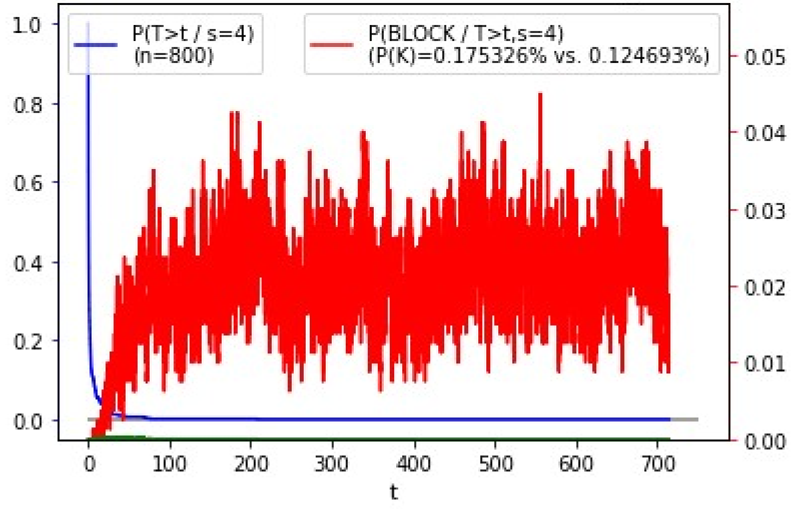
<matplotlib.figure.Figure at 0x1dbbf4ca588>



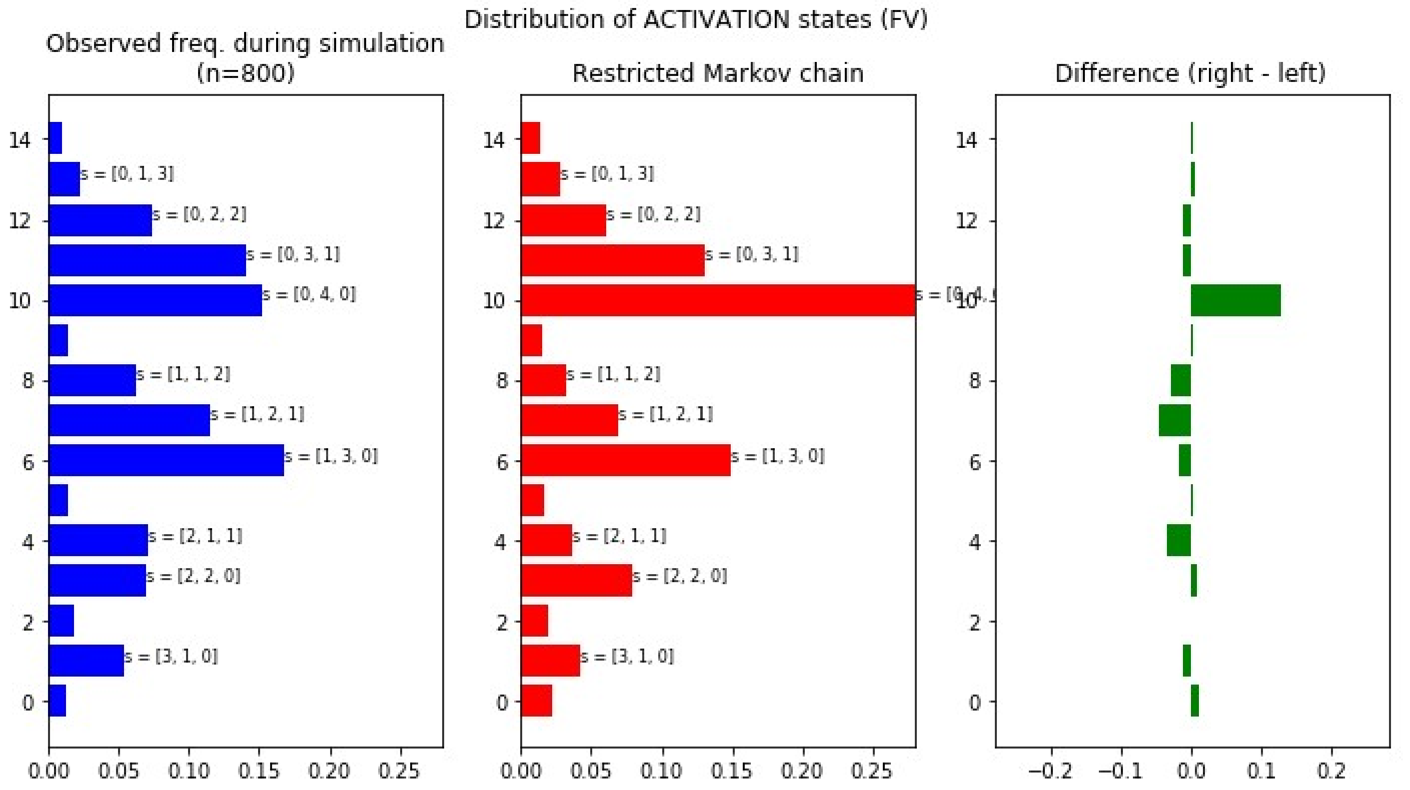
Distribution of ACTIVATION states (FV)
Observed freq. during simulation (n=800)
Restricted Markov chain
Difference (right - left)
s = [0, 1, 3]
s = [0, 2, 2]
s = [0, 3, 1]
s = [0, 4, 0]
s = [1, 1, 2]
s = [1, 2, 1]
s = [1, 3, 0]
s = [2, 1, 1]
s = [2, 2, 0]
s = [3, 1, 0]

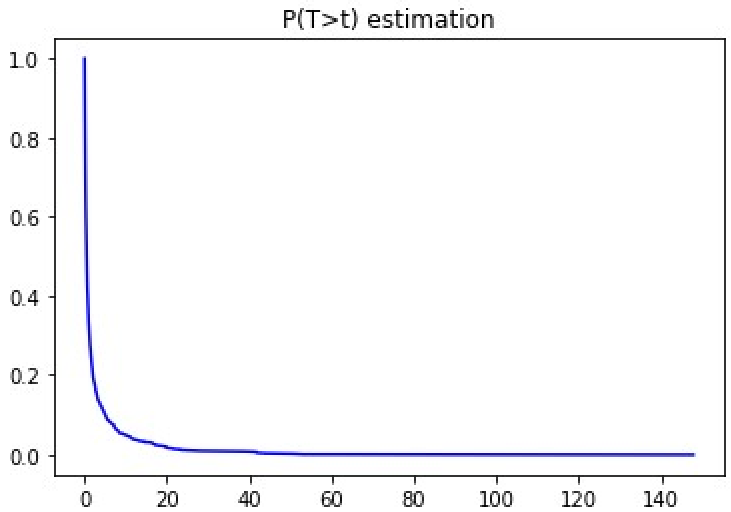


K=20, rhos=[0.4, 0.75, 0.35], N=800, activation size=4, maxtime(1)=0.0, maxtime(N)=714.3, mean_lifetime=5.6(n=800), finalize=ABS, seed=1737

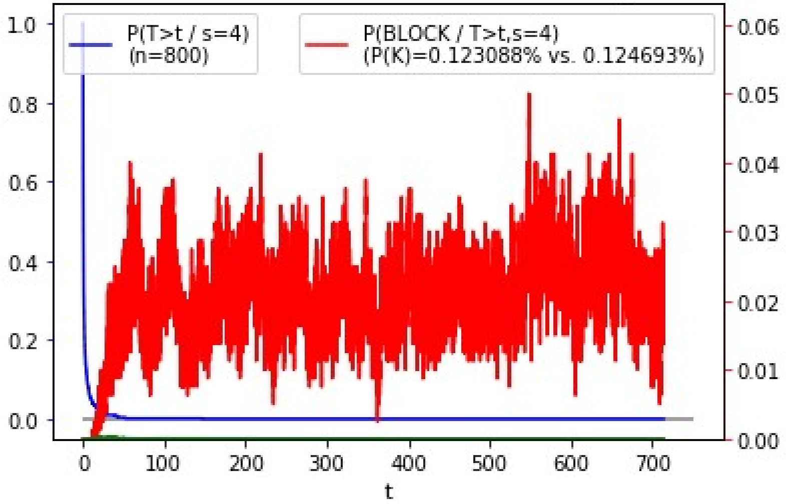



```
<matplotlib.figure.Figure at 0x1db9441f588>
```

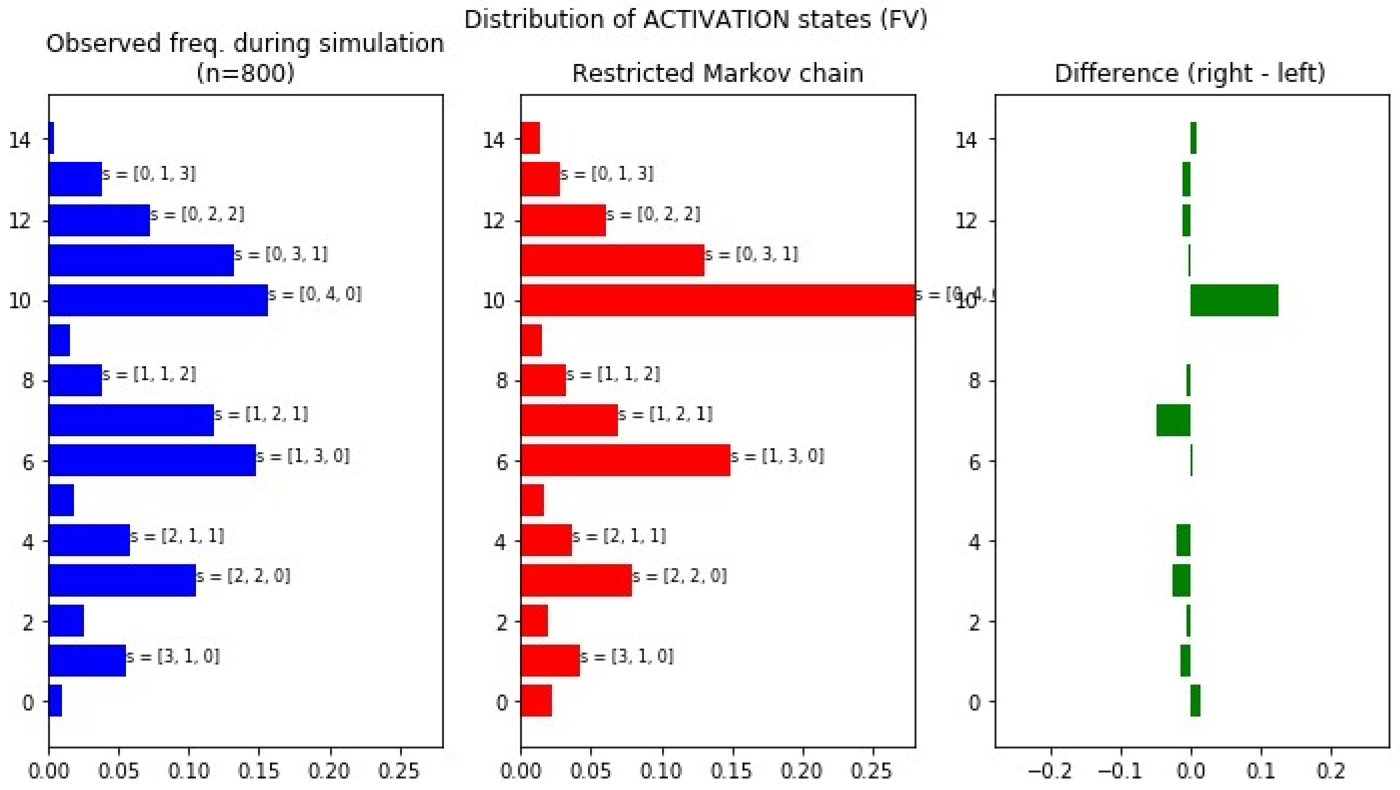

Distribution of ACTIVATION states (FV)
Observed freq. during simulation (n=800)
Restricted Markov chain
Difference (right - left)
s = [0, 1, 3]
s = [0, 2, 2]
s = [0, 3, 1]
s = [0, 4, 0]
s = [1, 1, 2]
s = [1, 2, 1]
s = [1, 3, 0]
s = [2, 1, 1]
s = [2, 2, 0]
s = [3, 1, 0]

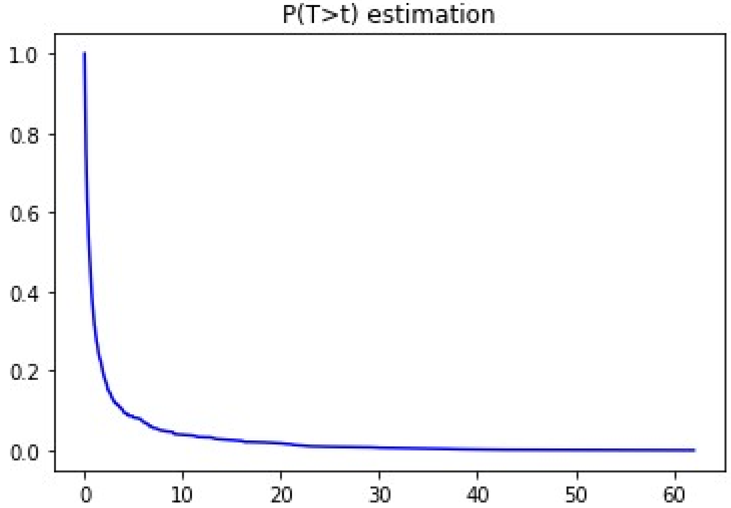


K=20, rhos=[0.4, 0.75, 0.35], N=800, activation size=4, maxtime(1)=0.0, maxtime(N)=714.3, mean_lifetime=4.9(n=800), finalize=ABS, seed=1747

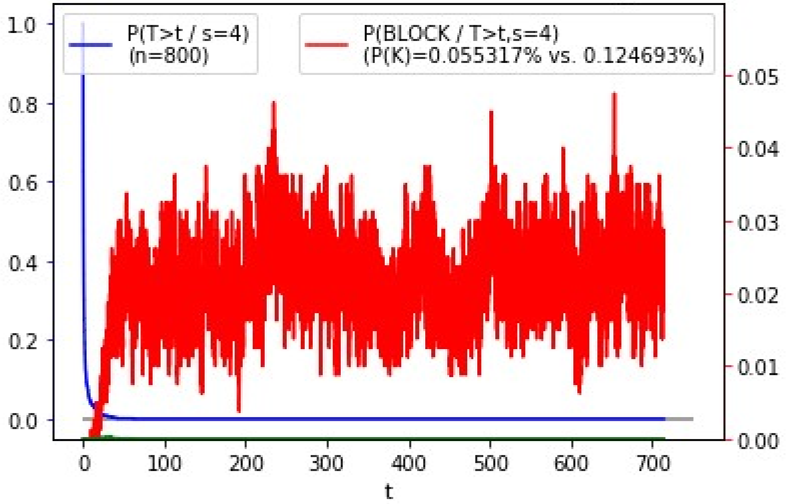


<matplotlib.figure.Figure at 0x1dbe7c191d0>

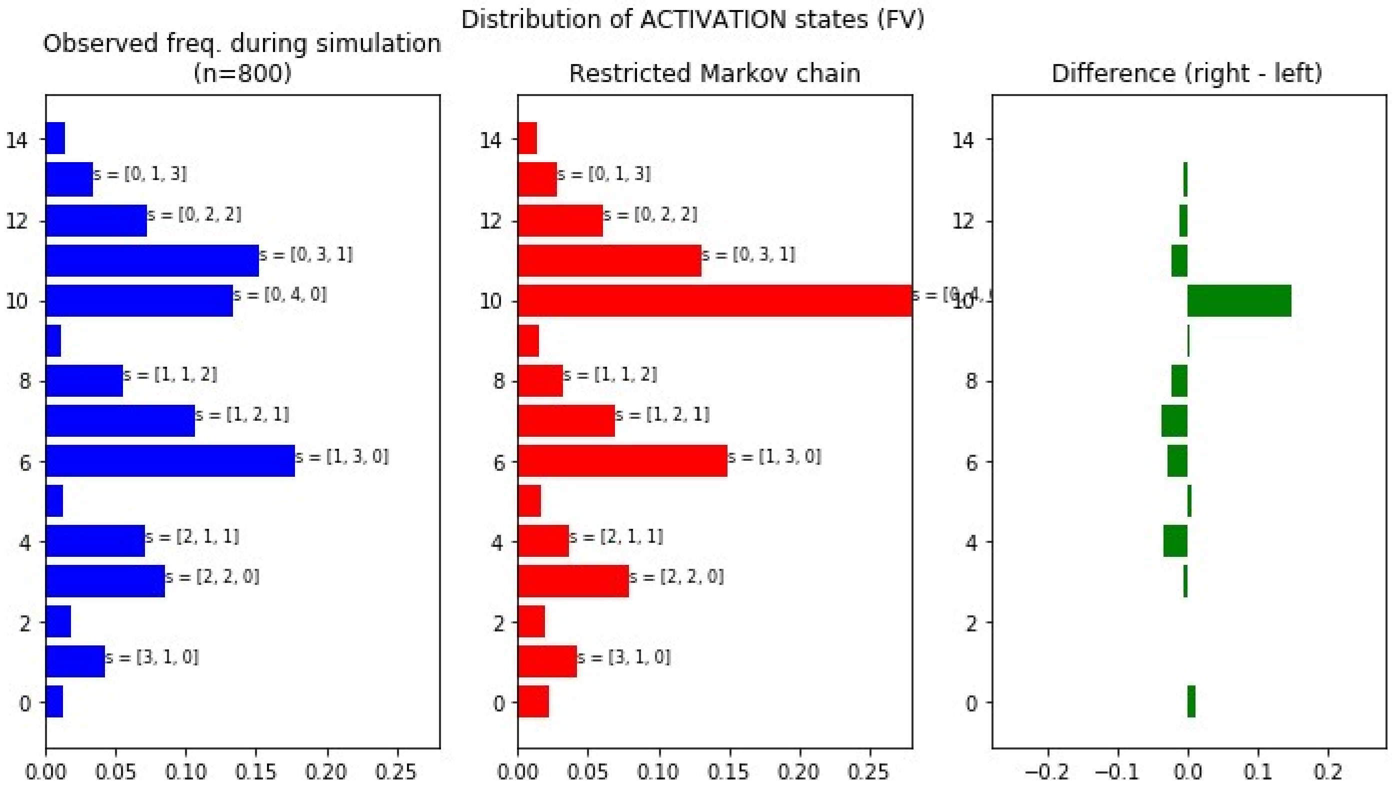

Distribution of ACTIVATION states (FV)
Observed freq. during simulation (n=800)
Restricted Markov chain
Difference (right - left)
s = [0, 1, 3]
s = [0, 2, 2]
s = [0, 3, 1]
s = [0, 4, 0]
s = [1, 1, 2]
s = [1, 2, 1]
s = [1, 3, 0]
s = [2, 1, 1]
s = [2, 2, 0]
s = [3, 1, 0]
0.00 0.05 0.10 0.15 0.20 0.25
−0.2 −0.1 0.0 0.1 0.2
0 2 4 6 8 10 12 14

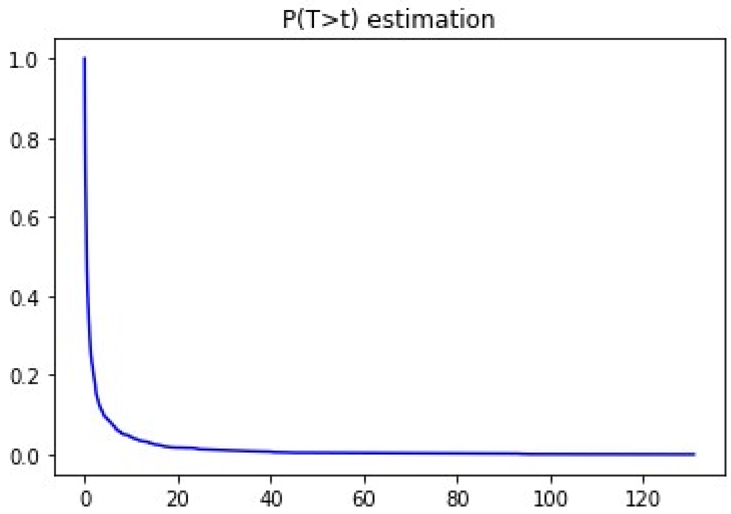


K=20, rhos=[0.4, 0.75, 0.35], N=800, activation size=4, maxtime(1)=0.0, maxtime(N)=714.3, mean_lifetime=4.5(n=800), finalize=ABS, seed=1757

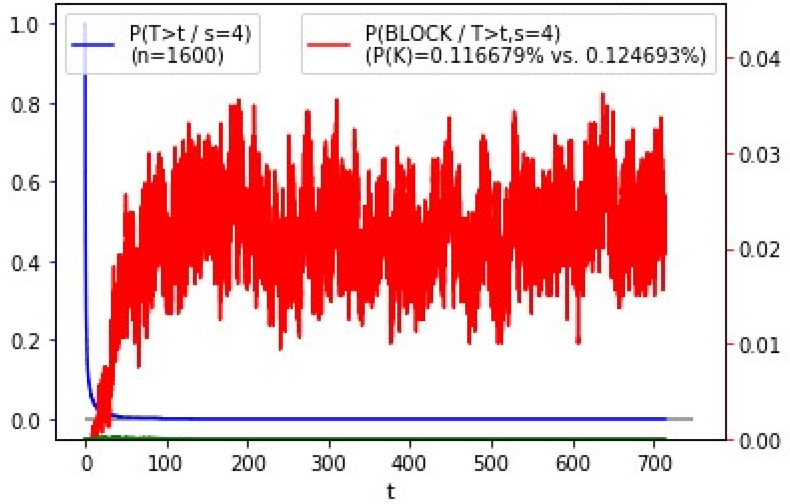


<matplotlib.figure.Figure at 0x1dbd7d4d630>

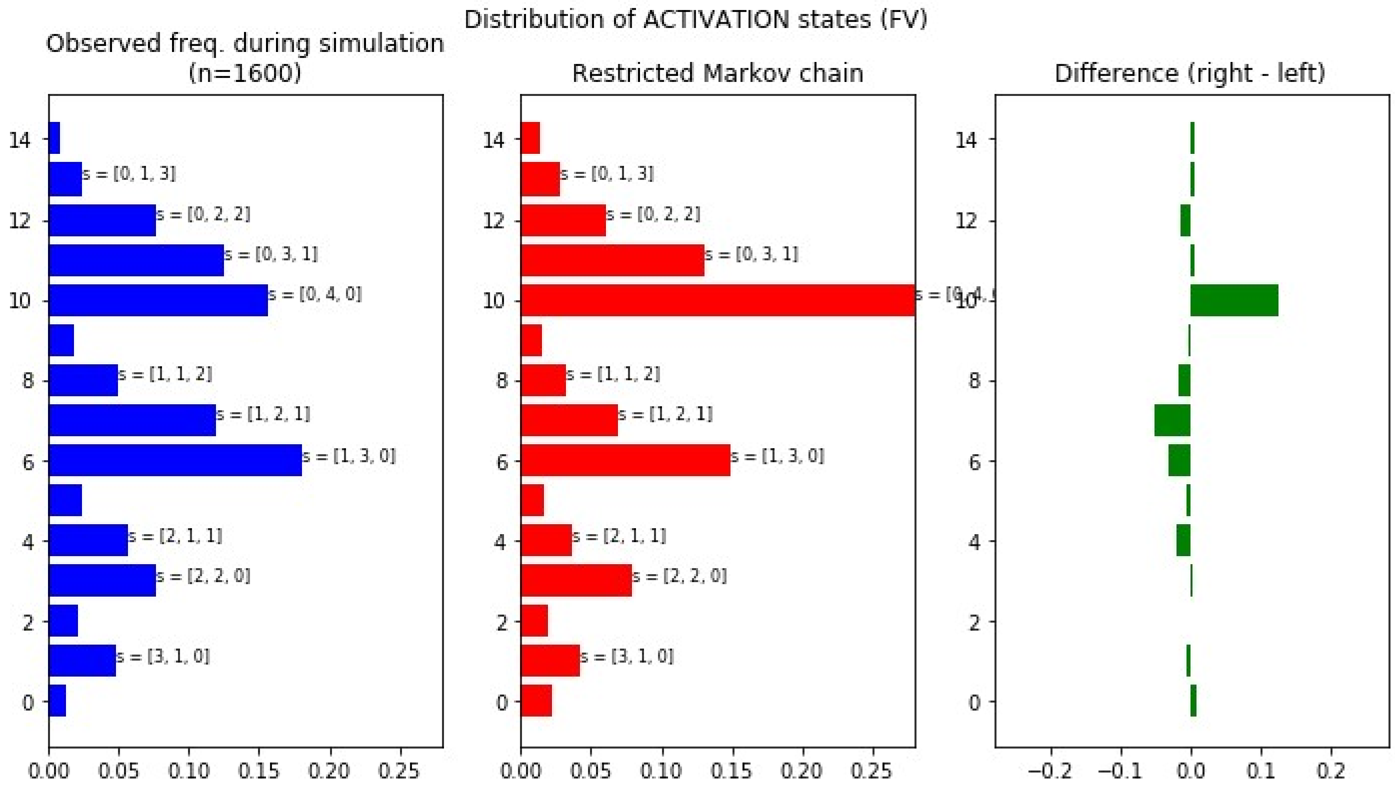

Distribution of ACTIVATION states (FV)
Observed freq. during simulation (n=800)
Restricted Markov chain
Difference (right - left)
s = [0, 1, 3]
s = [0, 2, 2]
s = [0, 3, 1]
s = [0, 4, 0]
s = [1, 1, 2]
s = [1, 2, 1]
s = [1, 3, 0]
s = [2, 1, 1]
s = [2, 2, 0]
s = [3, 1, 0]
0.00
0.05
0.10
0.15
0.20
0.25
−0.2
−0.1
0.0
0.1
0.2
0
2
4
6
8
10
12
14

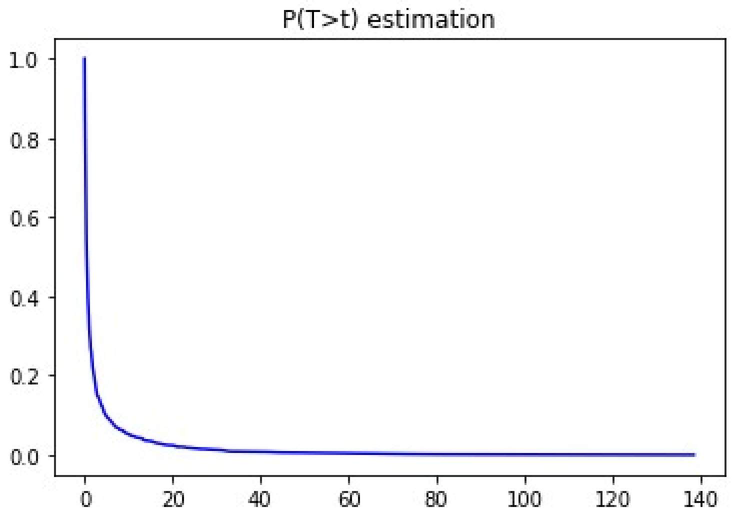


K=20, rhos=[0.4, 0.75, 0.35], N=1600, activation size=4, maxtime(1)=0.0, maxtime(N)=714.3, mean_lifetime=5.1(n=1600), finalize=ABS, seed=1717

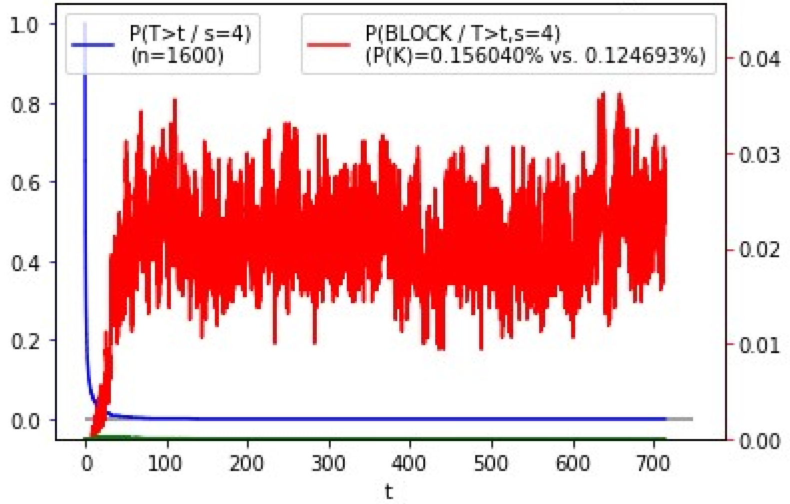


<matplotlib.figure.Figure at 0x1dbe9686320>

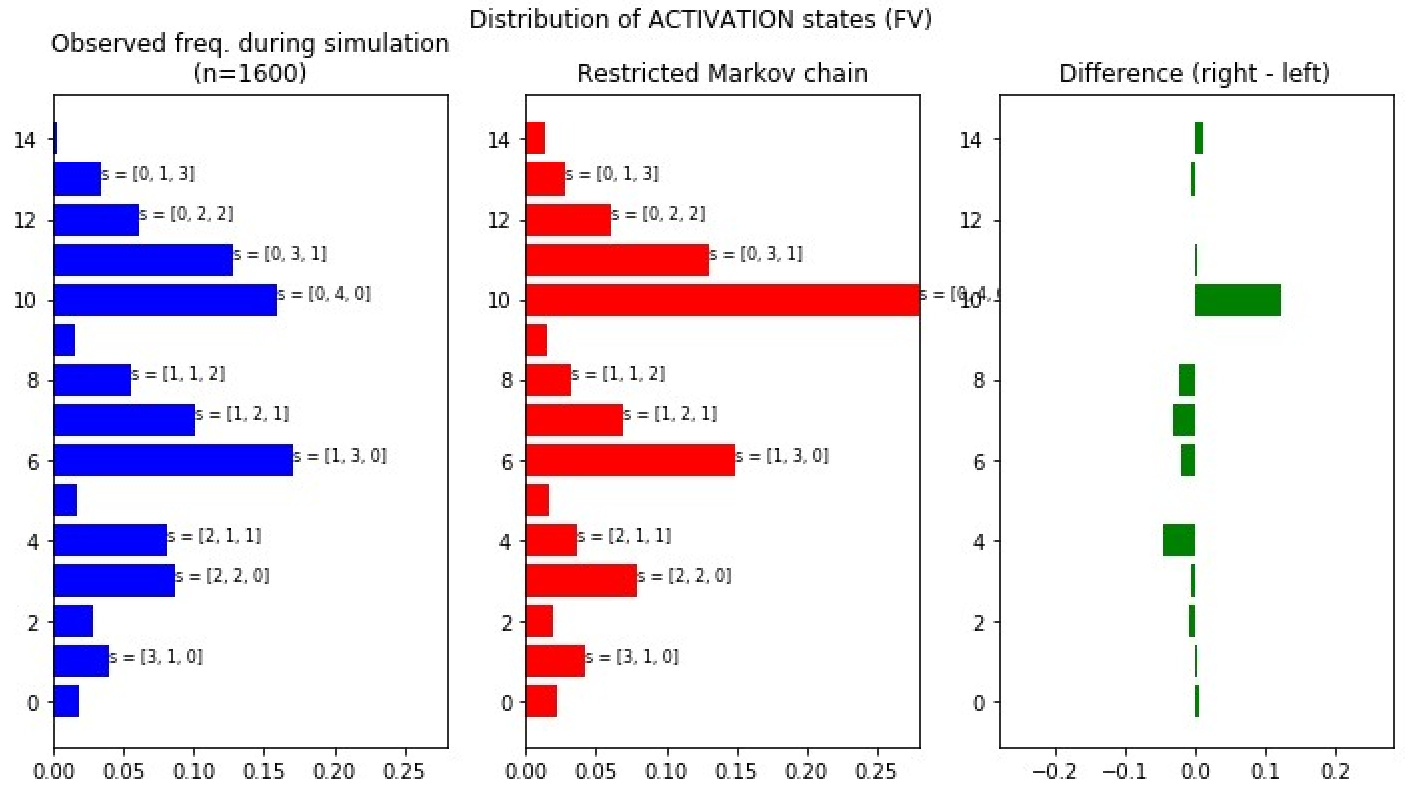

Distribution of ACTIVATION states (FV)
Observed freq. during simulation (n=1600)
Restricted Markov chain
Difference (right - left)
s = [0, 1, 3]
s = [0, 2, 2]
s = [0, 3, 1]
s = [0, 4, 0]
s = [1, 1, 2]
s = [1, 2, 1]
s = [1, 3, 0]
s = [2, 1, 1]
s = [2, 2, 0]
s = [3, 1, 0]



K=20, rhos=[0.4, 0.75, 0.35], N=1600, activation size=4, maxtime(1)=0.0, maxtime(N)=714.3, mean_lifetime=5.0(n=1600), finalize=ABS, seed=1727



<matplotlib.figure.Figure at 0x1dbd672d898>


Distribution of ACTIVATION states (FV)
Observed freq. during simulation (n=1600)
Restricted Markov chain
Difference (right - left)
s = [0, 1, 3]
s = [0, 2, 2]
s = [0, 3, 1]
s = [0, 4, 0]
s = [1, 1, 2]
s = [1, 2, 1]
s = [1, 3, 0]
s = [2, 1, 1]
s = [2, 2, 0]
s = [3, 1, 0]
0.00
0.05
0.10
0.15
0.20
0.25
−0.2
−0.1
0.0
0.1
0.2

In [2]:

In [2]: