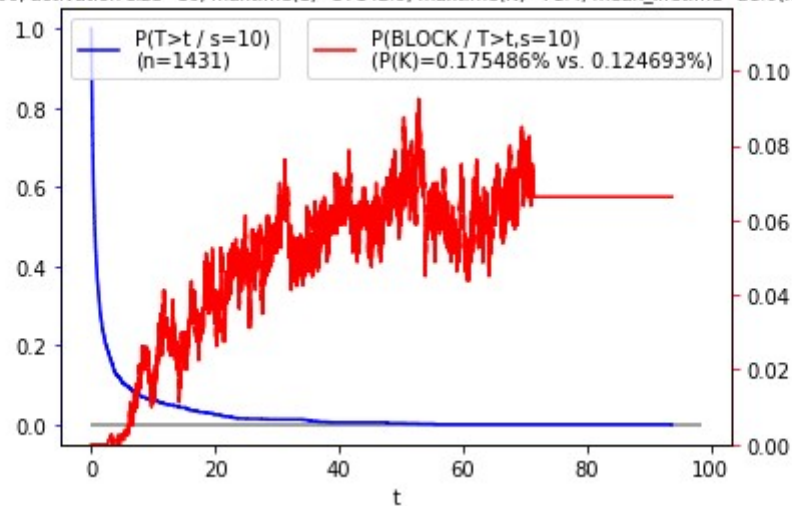```
Python 3.6.4 |Anaconda custom (64-bit)| (default, Jan 16 2018, 10:22:32) [MSC v.1900 64 bit (AMD64)]
Type "copyright", "credits" or "license" for more information.

IPython 6.2.1 -- An enhanced Interactive Python.

Restarting kernel...
```
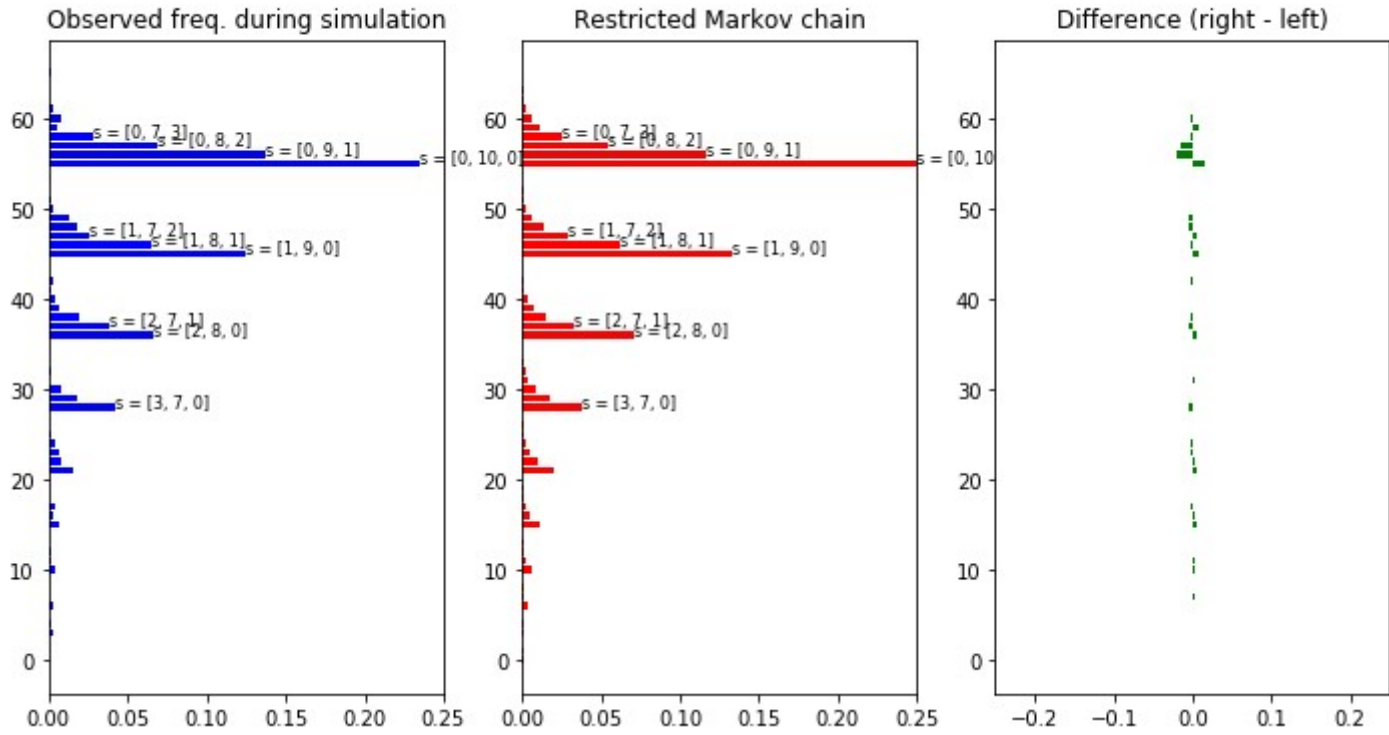
---

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.
Log file '../../RL-002-QueueBlocking/logs/test_fv_implementation_20210506_164135.log' has been open for
output.
Started at: 2021-05-06 16:41:35
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)
C:\ProgramData\Anaconda\Anaconda3\lib\site-packages\pandas\core\groupby.py:4291: FutureWarning: using a
dict with renaming is deprecated and will be removed in a future version
  return super(DataFrameGroupBy, self).aggregate(arg, *args, **kwargs)
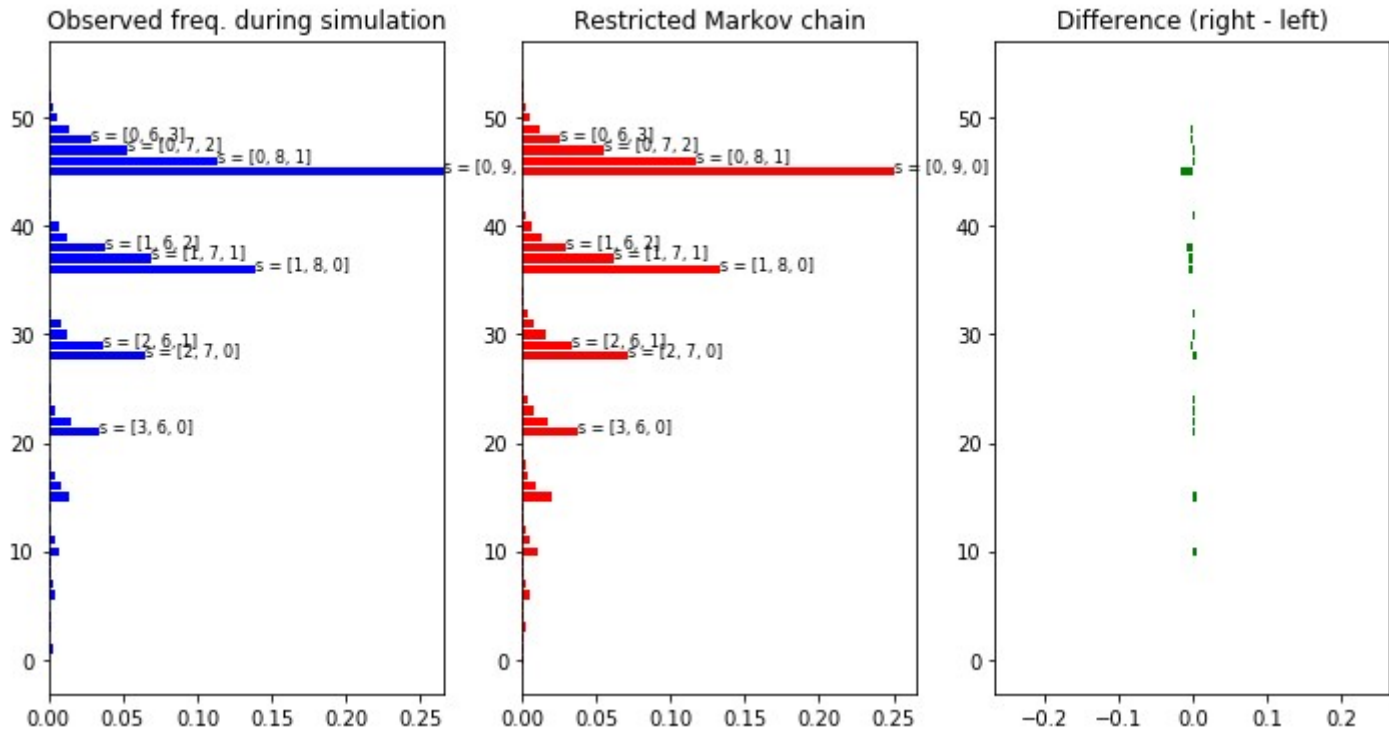Ended at: 2021-05-06 20:16:33
Execution time: 215.0 min, 3.6 hours

## Distribution of ACTIVATION states

| Observed freq. during simulation | Restricted Markov chain | Difference (right - left) |

## Distribution of ABSORPTION states

| Observed freq. during simulation | Restricted Markov chain | Difference (right - left) |

K=20, rhos=[0.4, 0.75, 0.35], N=800, activation size=10, maxtime(1)=57142.9, maxtime(N)=71.4, mean_lifetime=21.2(n=2699), finalize=ABS, seed=1?
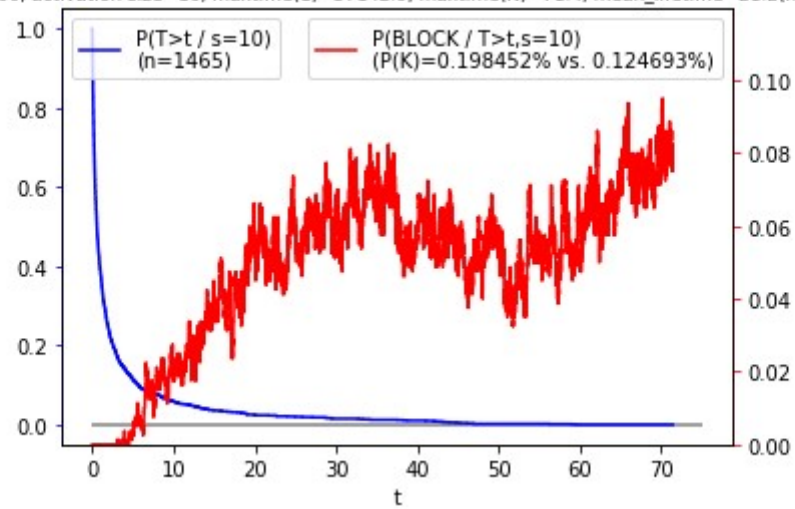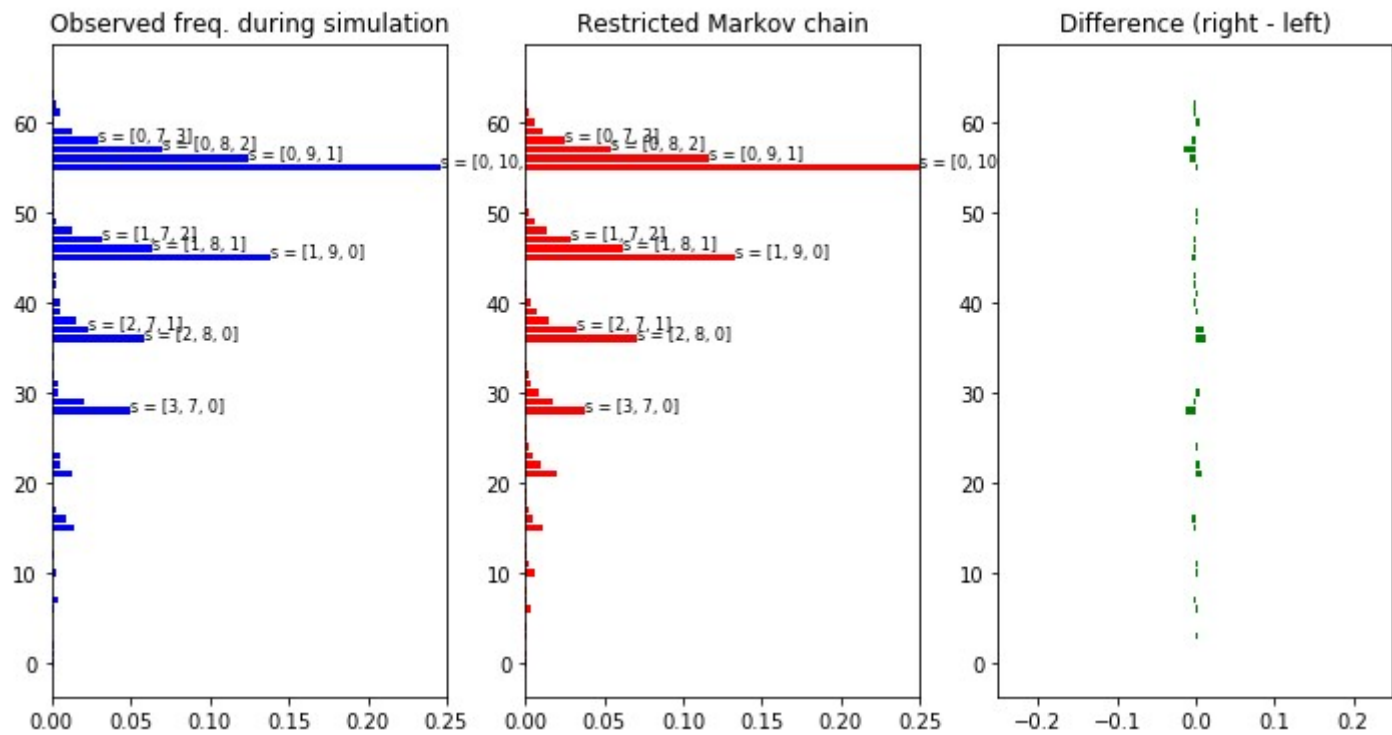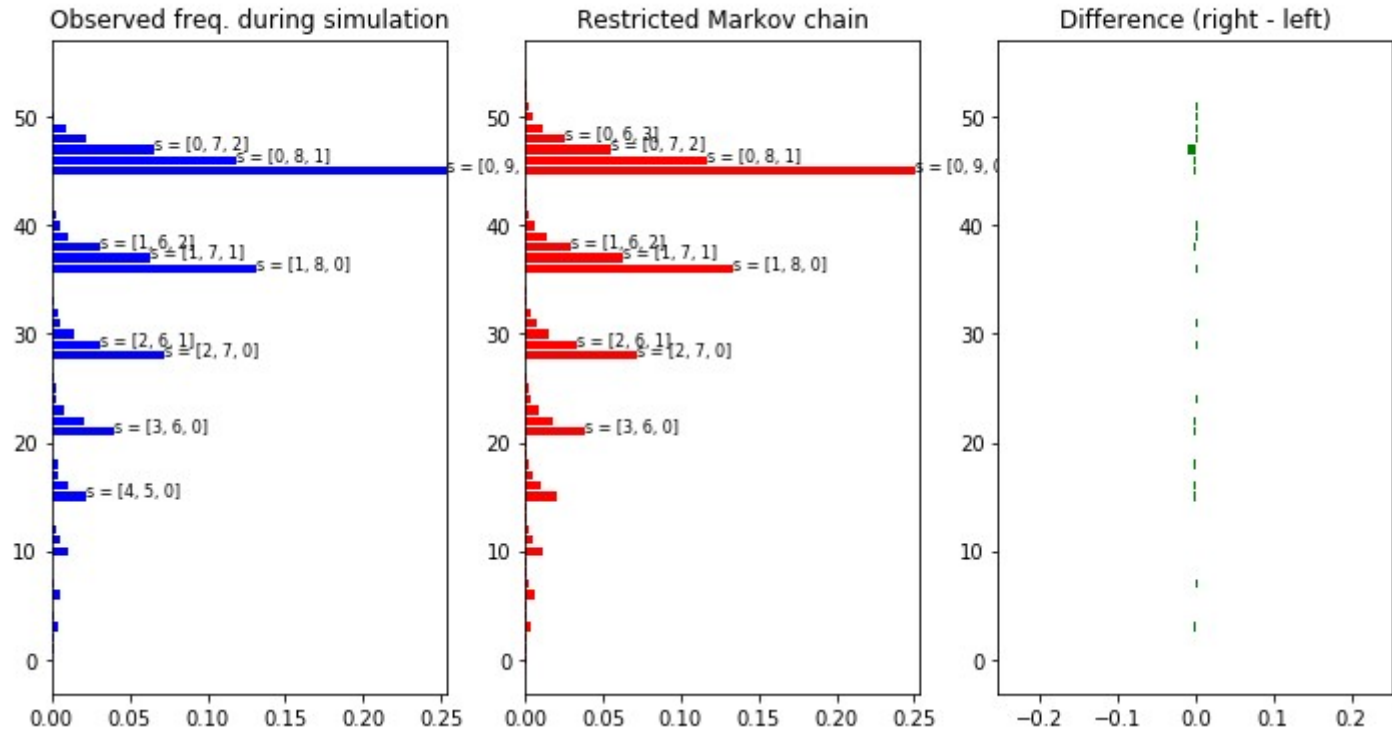


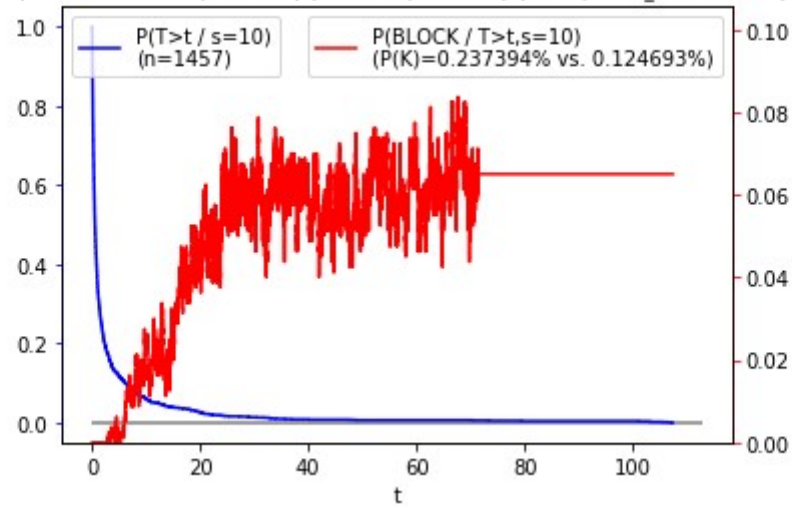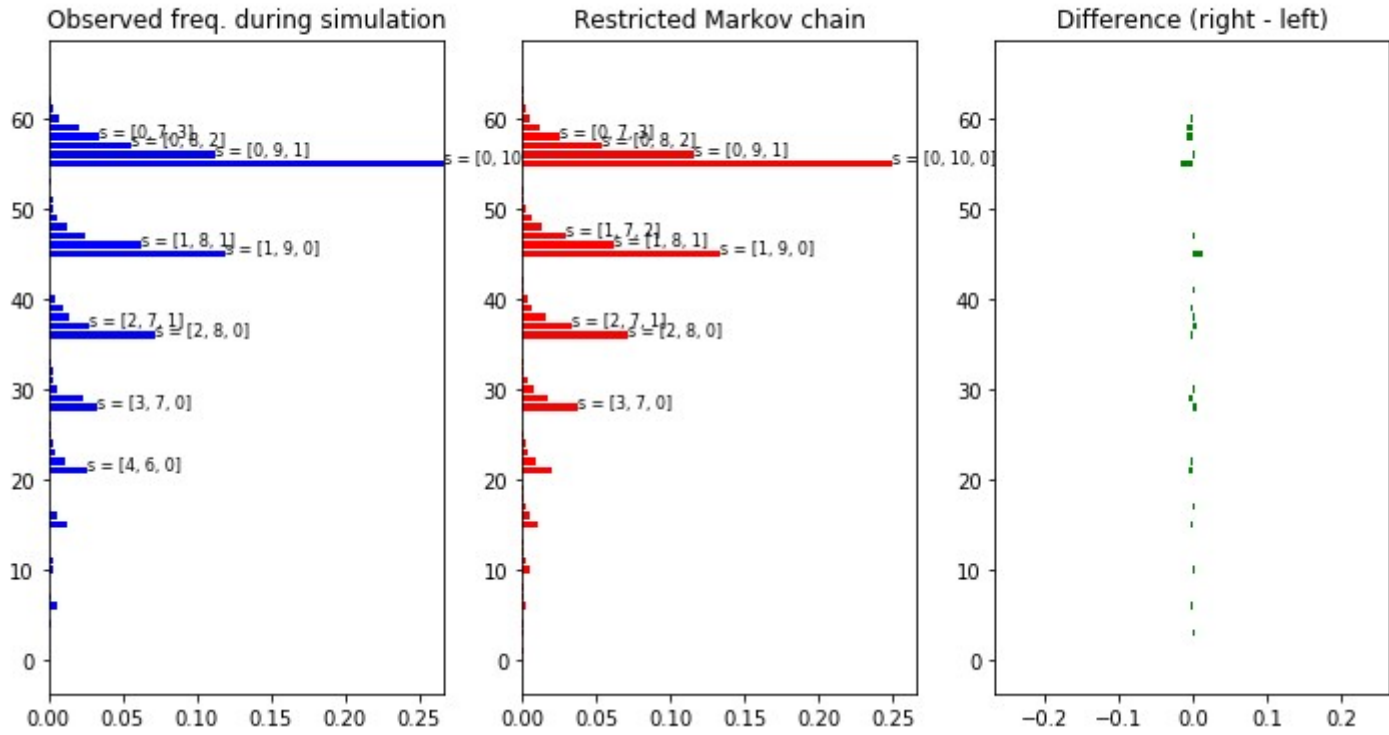Distribution of ACTIVATION states

# Distribution of ABSORPTION states



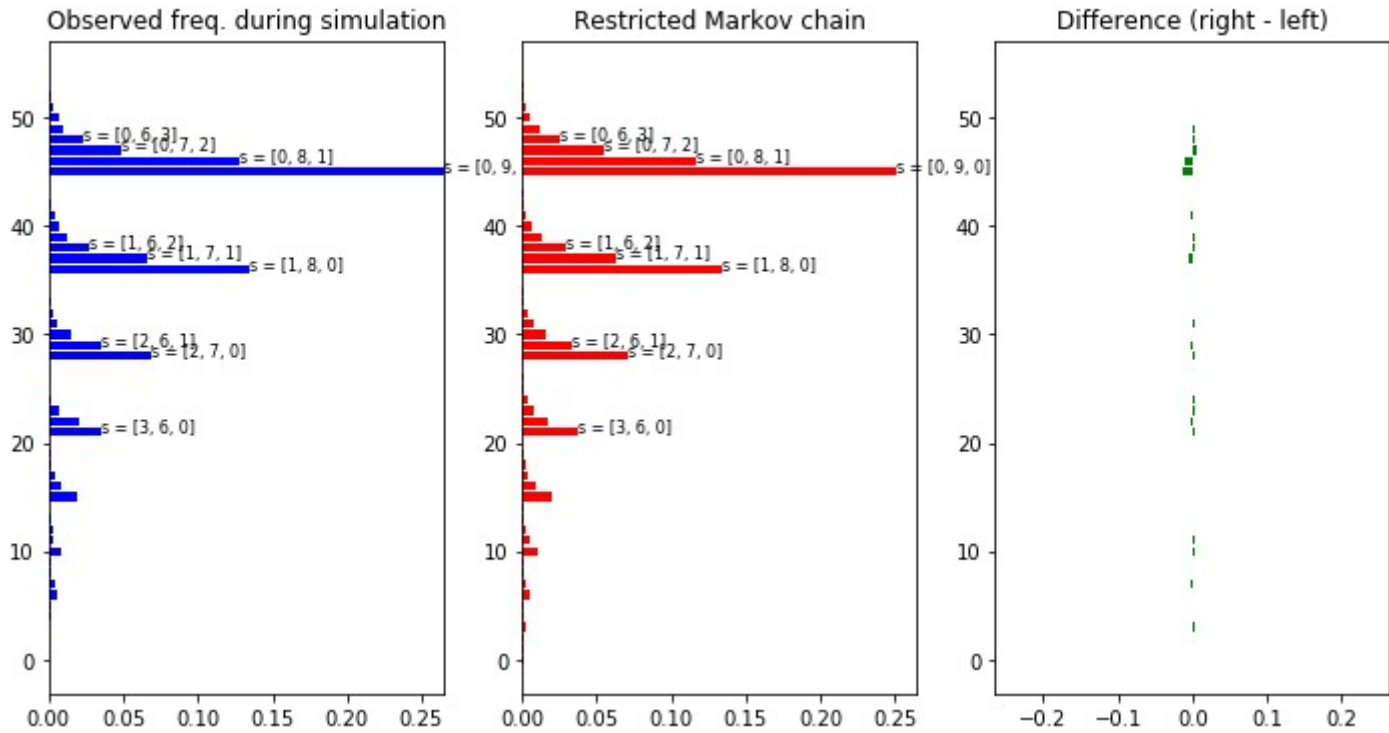Observed freq. during simulation | Restricted Markov chain | Difference (right - left)

K=20, rhos=[0.4, 0.75, 0.35], N=800, activation size=10, maxtime(1)=57142.9, maxtime(N)=71.4, mean_lifetime=22.7(n=2518), finalize=ABS, seed=1
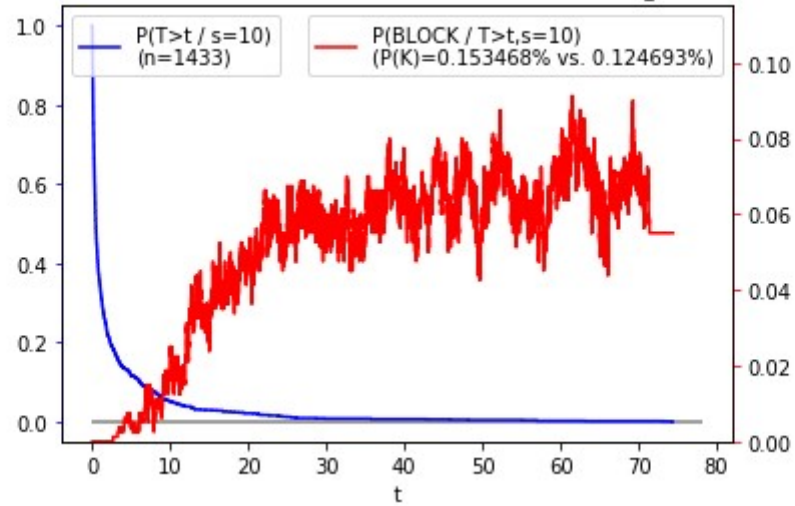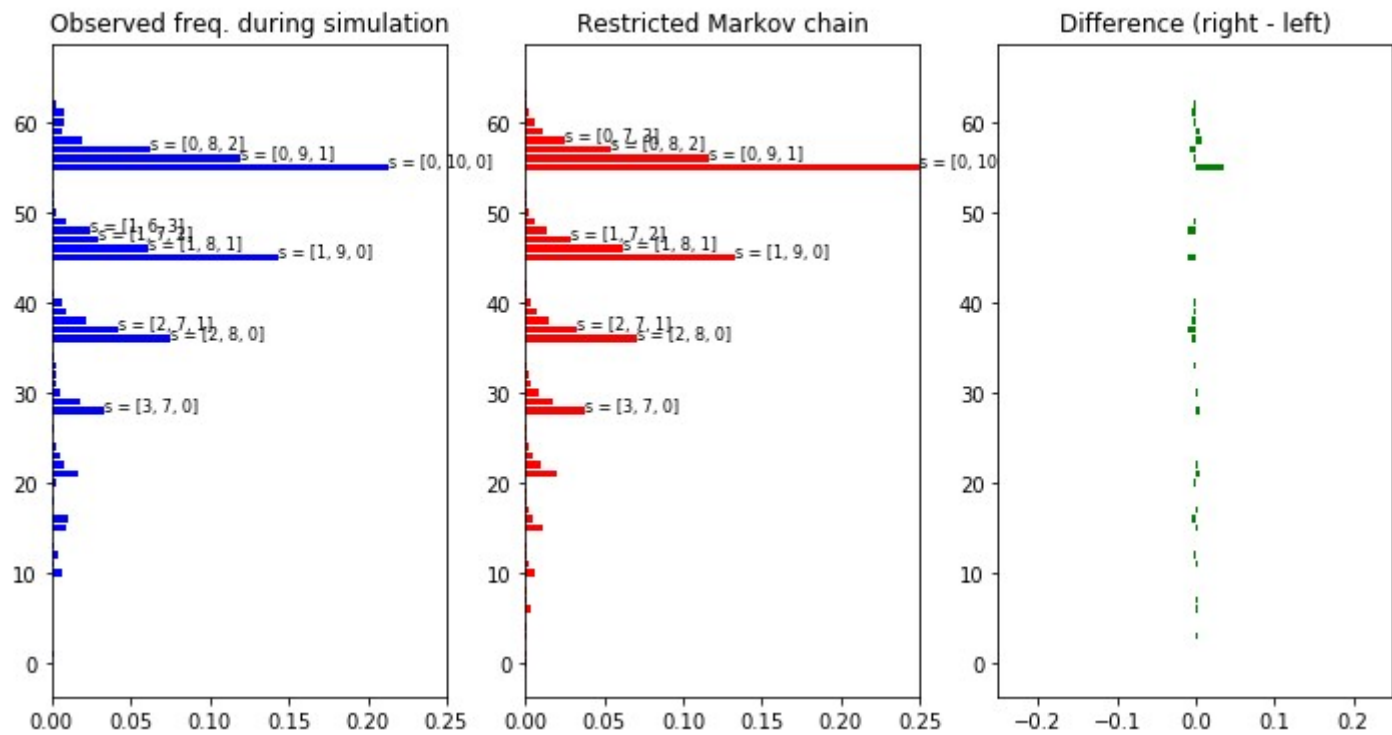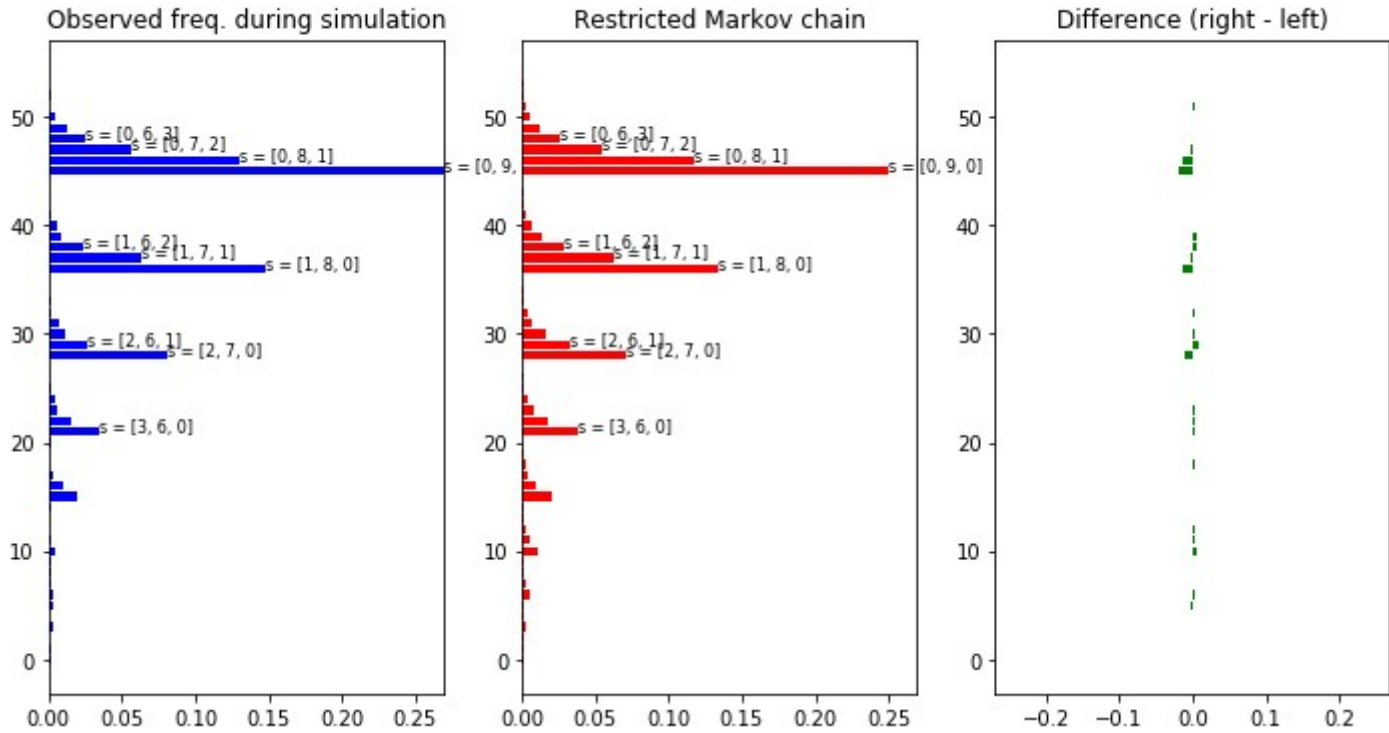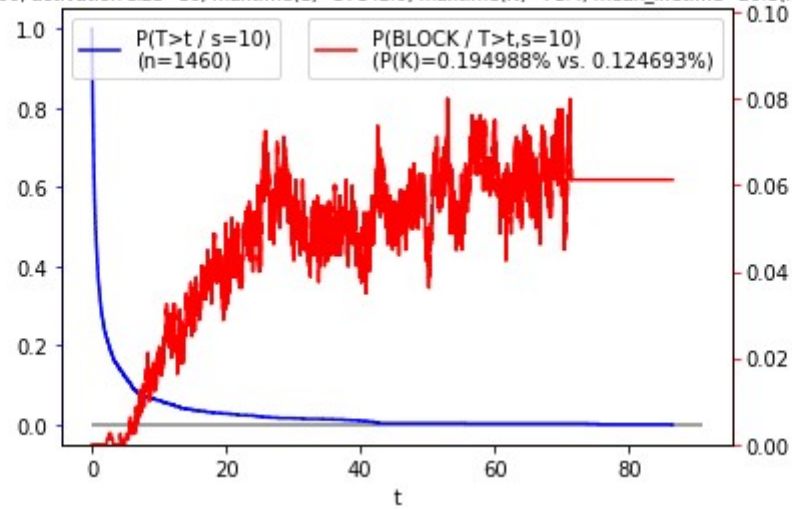
# Distribution of ACTIVATION states

## Observed freq. during simulation

s = [0, 7, 3]
s = [0, 8, 2]
s = [0, 9, 1]
s = [0, 10, 0]
s = [1, 8, 1]
s = [1, 9, 0]
s = [2, 7, 1]
s = [2, 8, 0]
s = [3, 7, 0]
s = [4, 6, 0]

## Restricted Markov chain

s = [0, 7, 3]
s = [0, 8, 2]
s = [0, 9, 1]
s = [0, 10, 0]
s = [1, 7, 2]
s = [1, 8, 1]
s = [1, 9, 0]
s = [2, 7, 1]
s = [2, 8, 0]
s = [3, 7, 0]

## Difference (right - left)

# Distribution of ABSORPTION states

## Observed freq. during simulation

s = [0, 6, 3]
s = [0, 7, 2]
s = [0, 8, 1]
s = [0, 9, 0]
s = [1, 6, 2]
s = [1, 7, 1]
s = [1, 8, 0]
s = [2, 6, 1]
s = [2, 7, 0]
s = [3, 6, 0]

## Restricted Markov chain

s = [0, 6, 3]
s = [0, 7, 2]
s = [0, 8, 1]
s = [0, 9, 0]
s = [1, 6, 2]
s = [1, 7, 1]
s = [1, 8, 0]
s = [2, 6, 1]
s = [2, 7, 0]
s = [3, 6, 0]

## Difference (right - left)

K=20, rhos=[0.4, 0.75, 0.35], N=800, activation size=10, maxtime(1)=57142.9, maxtime(N)=71.4, mean_lifetime=21.6(n=2635), finalize=ABS, seed=1
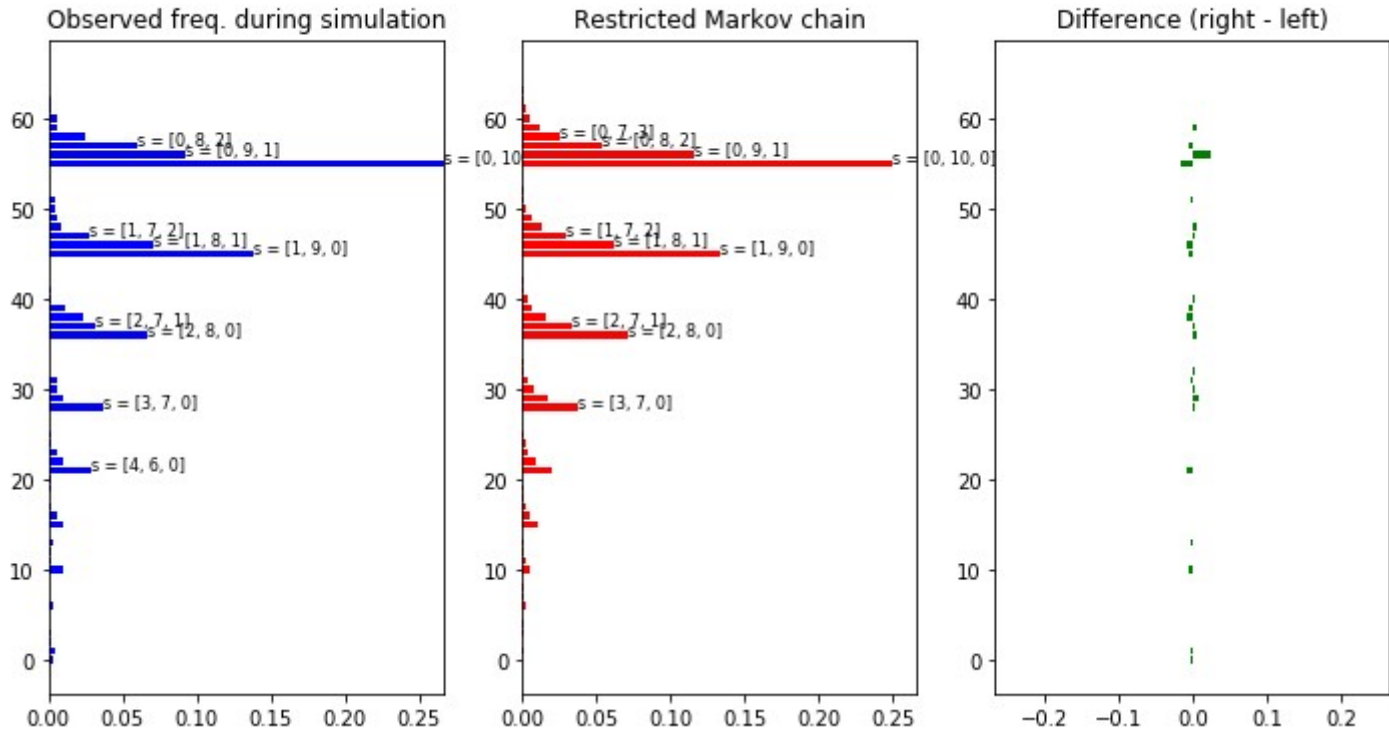


## Distribution of ACTIVATION states
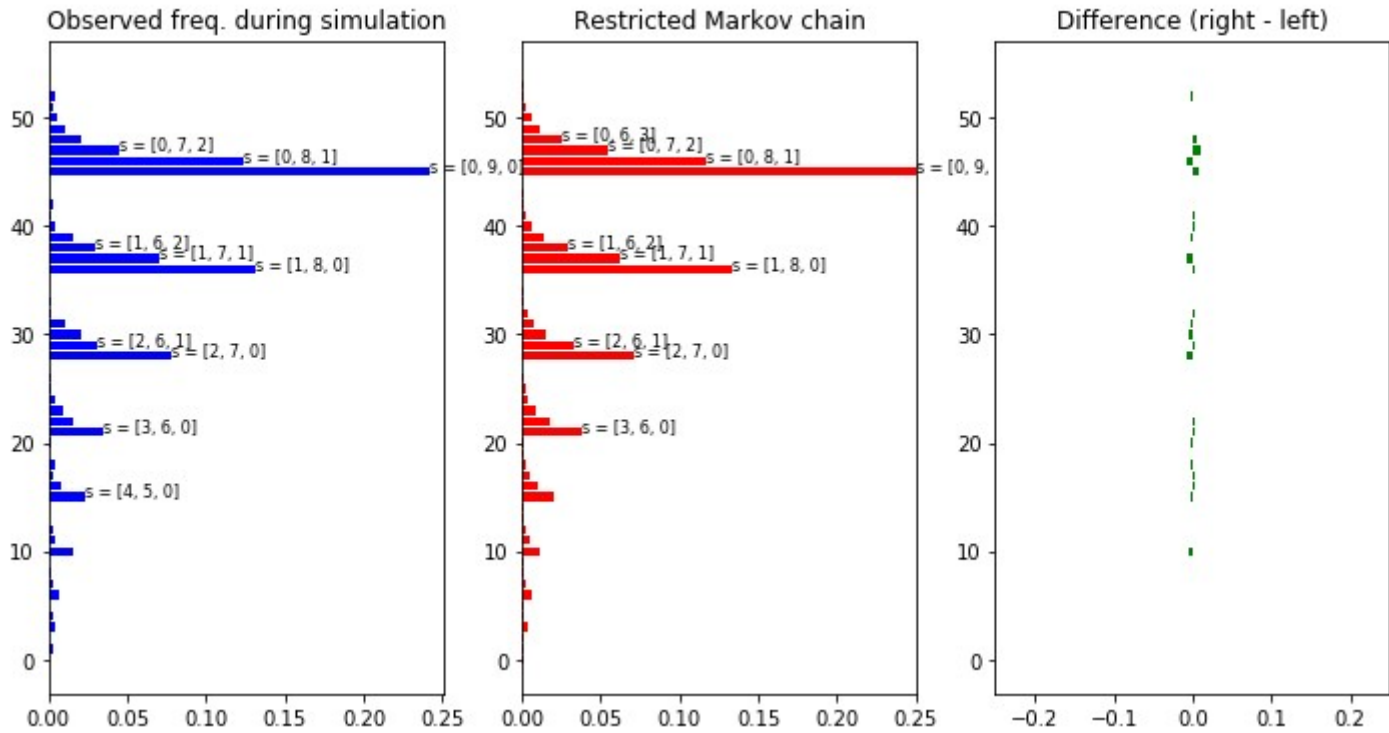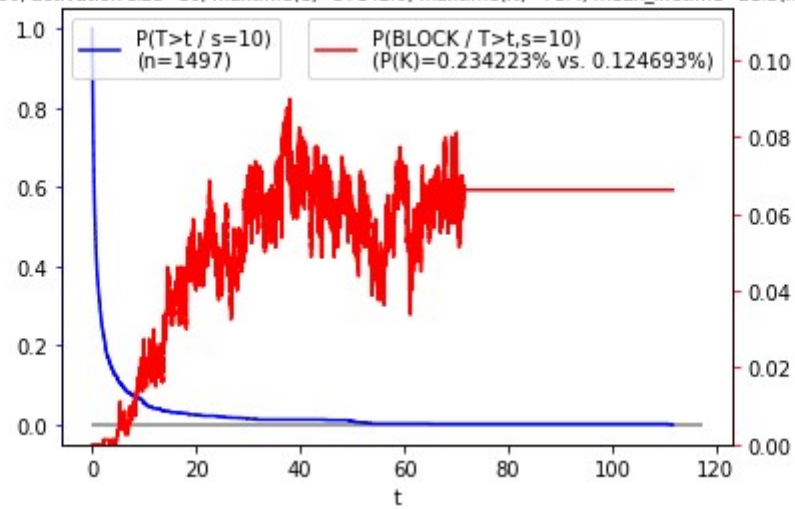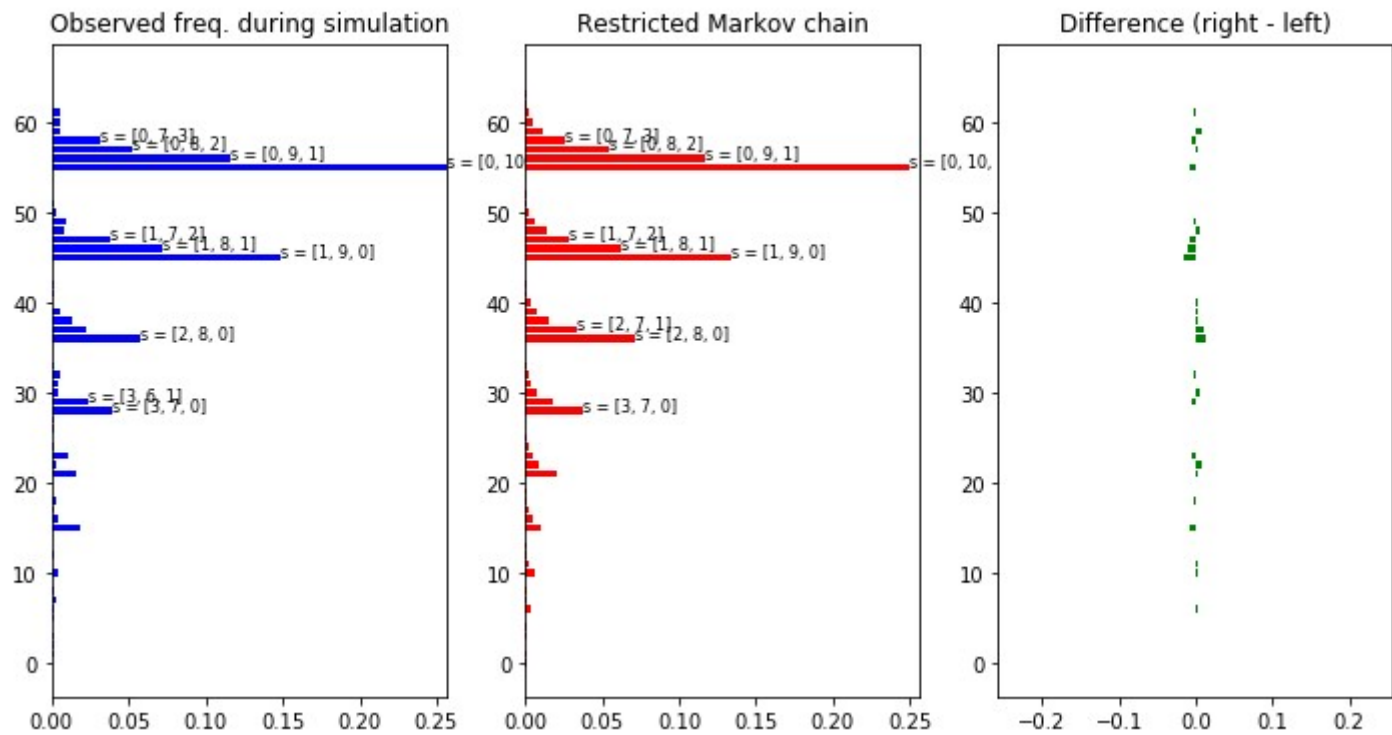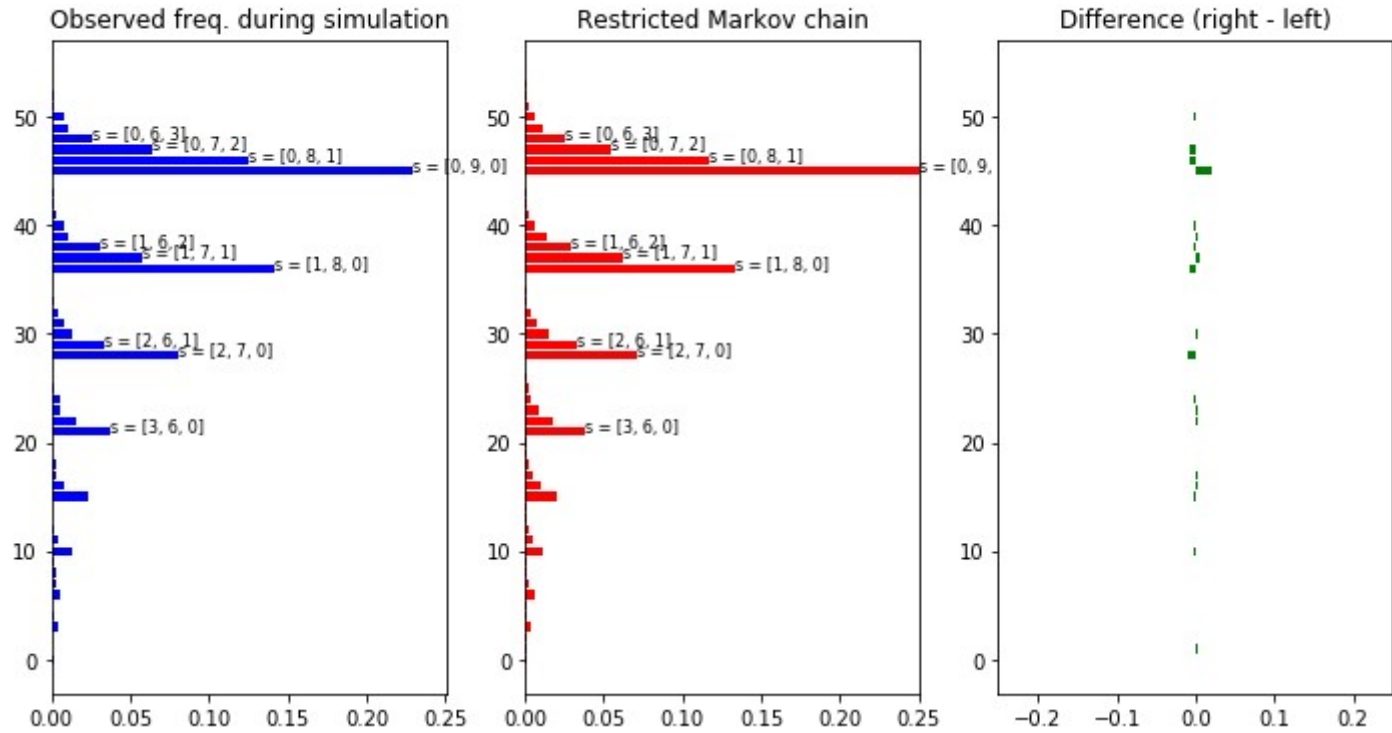
# Distribution of ABSORPTION states

| Observed freq. during simulation | Restricted Markov chain | Difference (right - left) |
|---|---|---|



K=20, rhos=[0.4, 0.75, 0.35], N=800, activation size=10, maxtime(1)=57142.9, maxtime(N)=71.4, mean_lifetime=20.8(n=2747), finalize=ABS, seed=1?
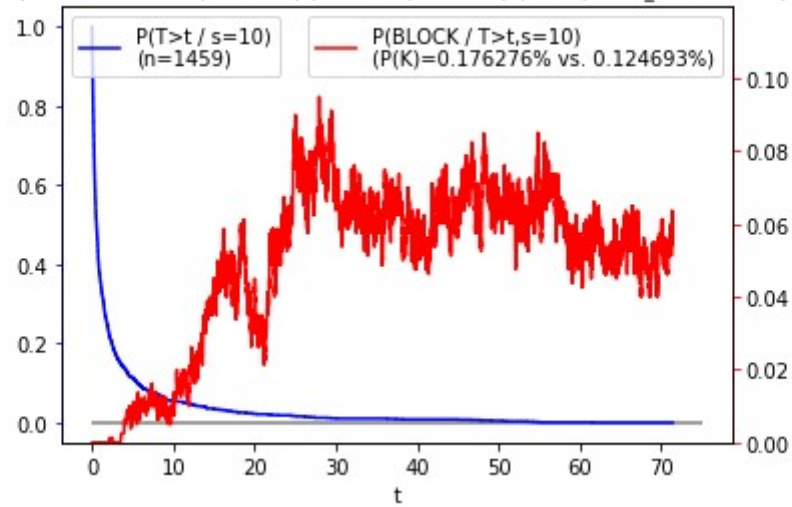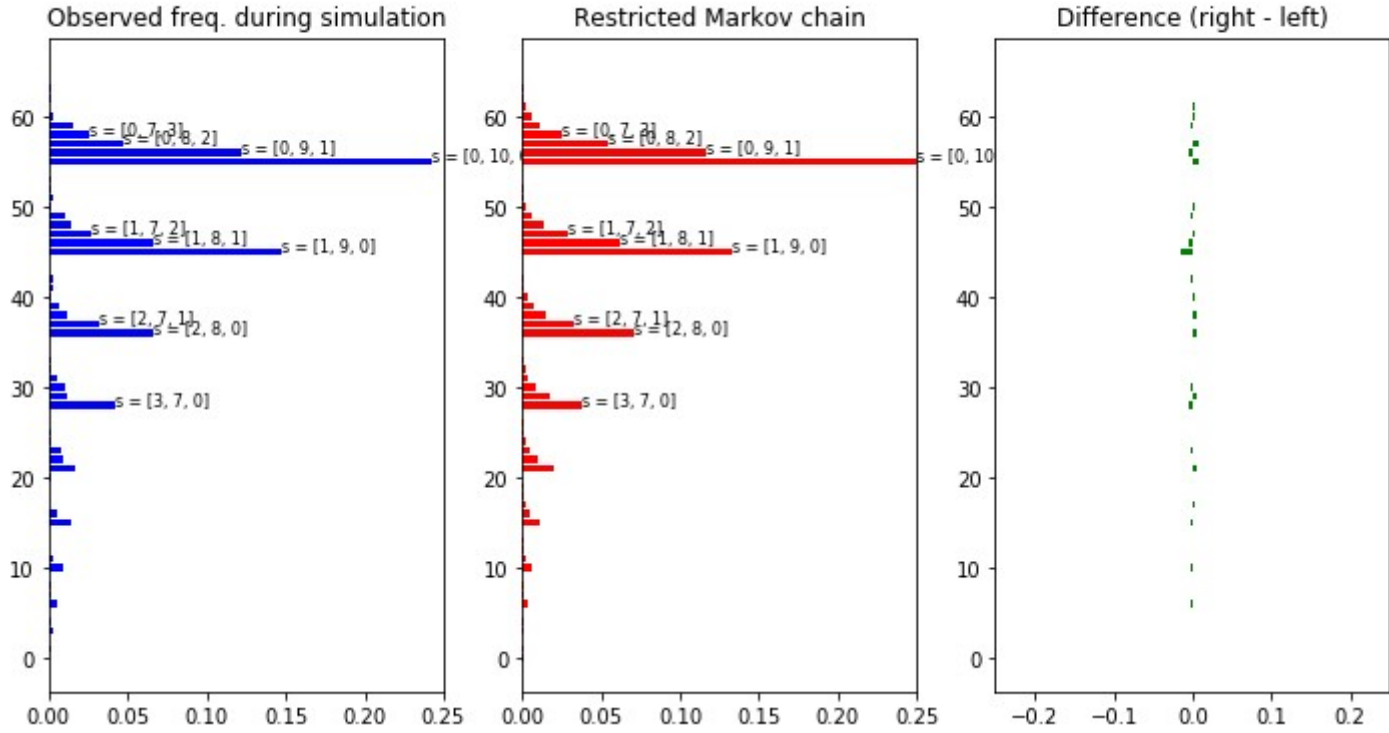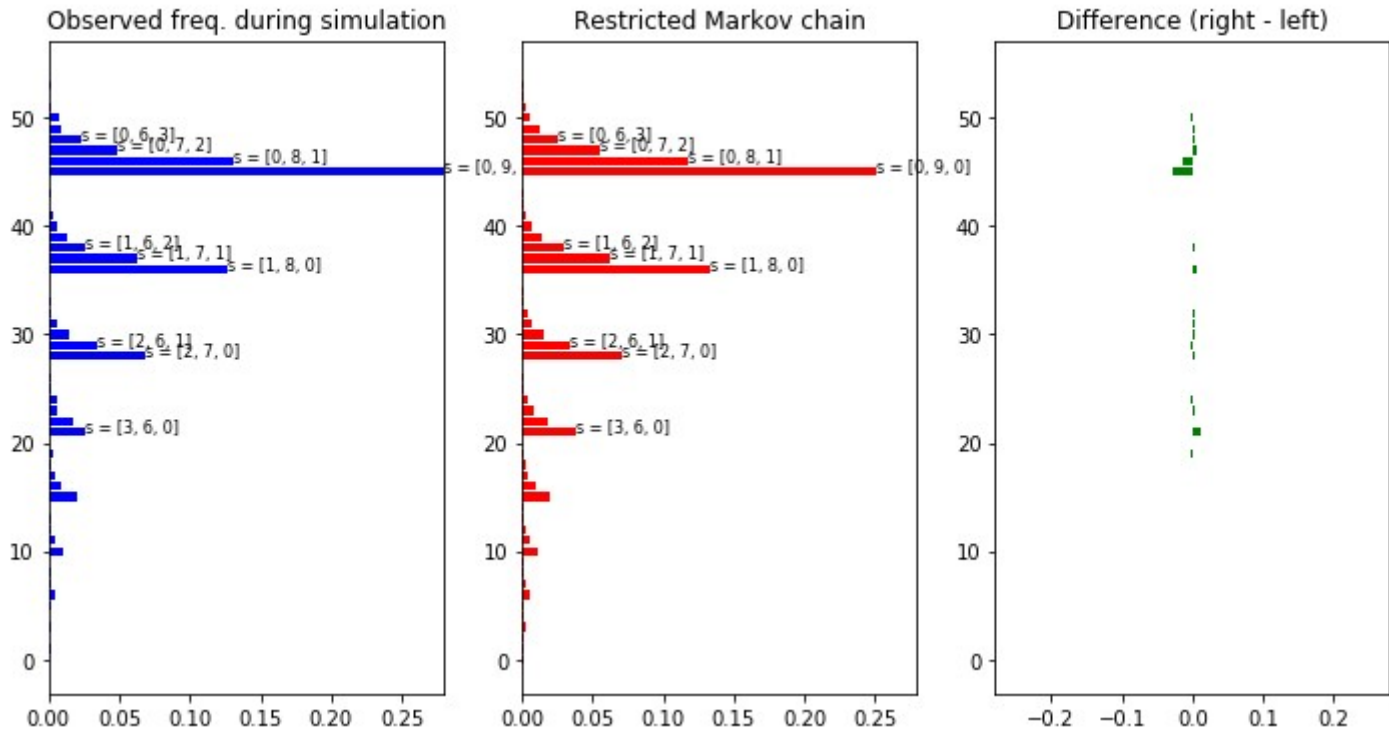


P(T>t / s=10)
(n=1460)

P(BLOCK / T>t,s=10)
(P(K)=0.194988% vs. 0.124693%)

# Distribution of ACTIVATION states



Observed freq. during simulation | Restricted Markov chain | Difference (right - left)

# Distribution of ABSORPTION states



Observed freq. during simulation | Restricted Markov chain | Difference (right - left)

K=20, rhos=[0.4, 0.75, 0.35], N=800, activation size=10, maxtime(1)=57142.9, maxtime(N)=71.4, mean_lifetime=21.3(n=2671), finalize=ABS, seed=17
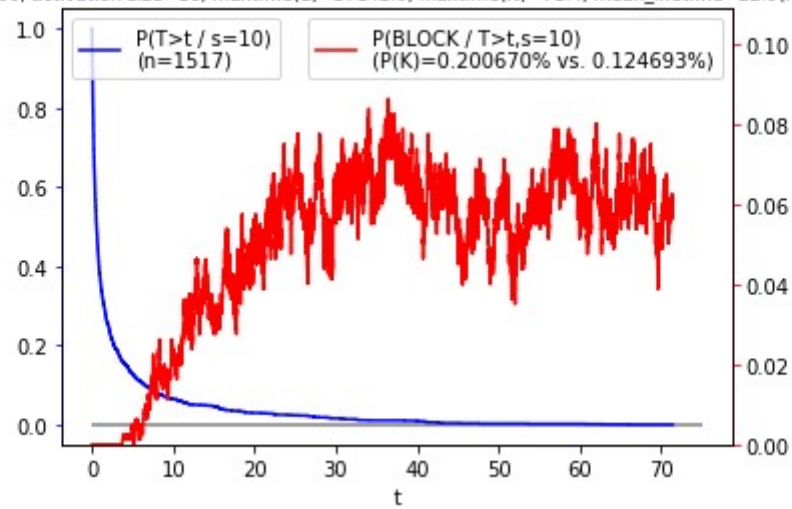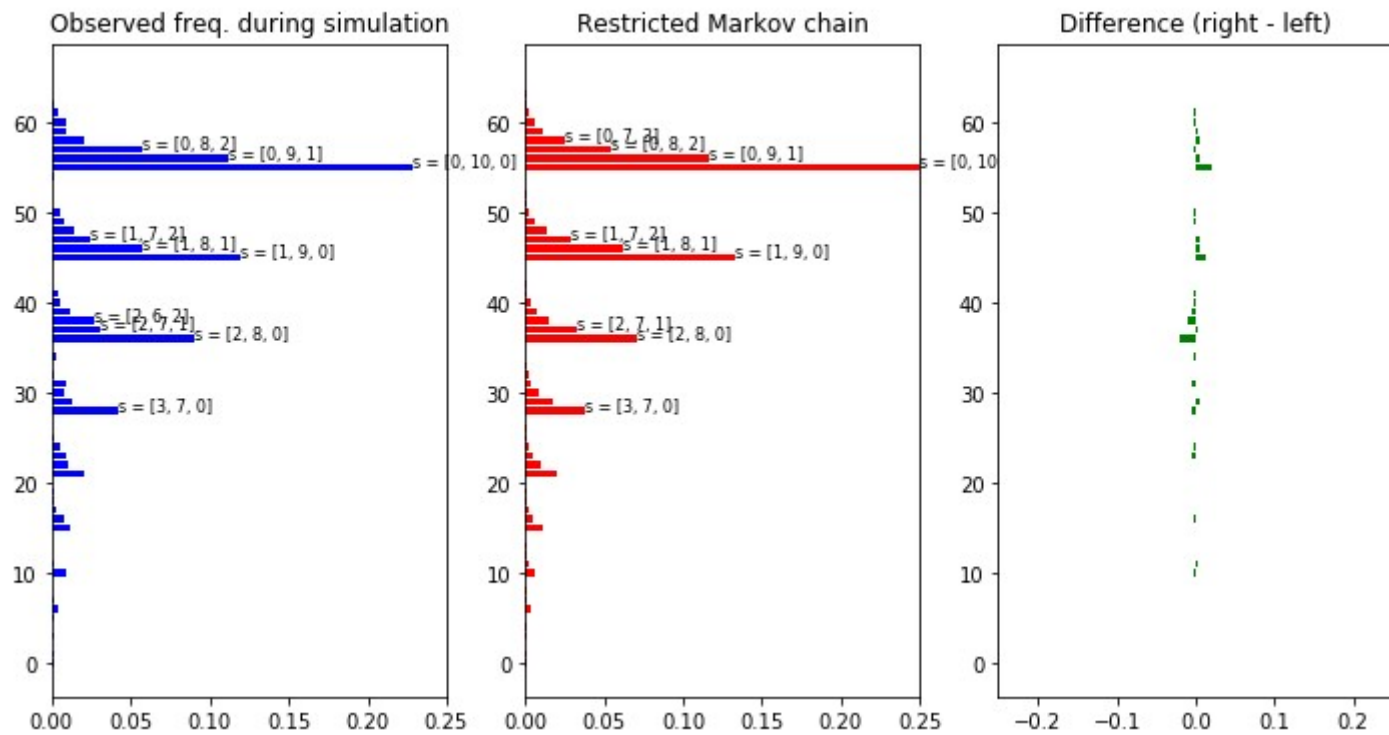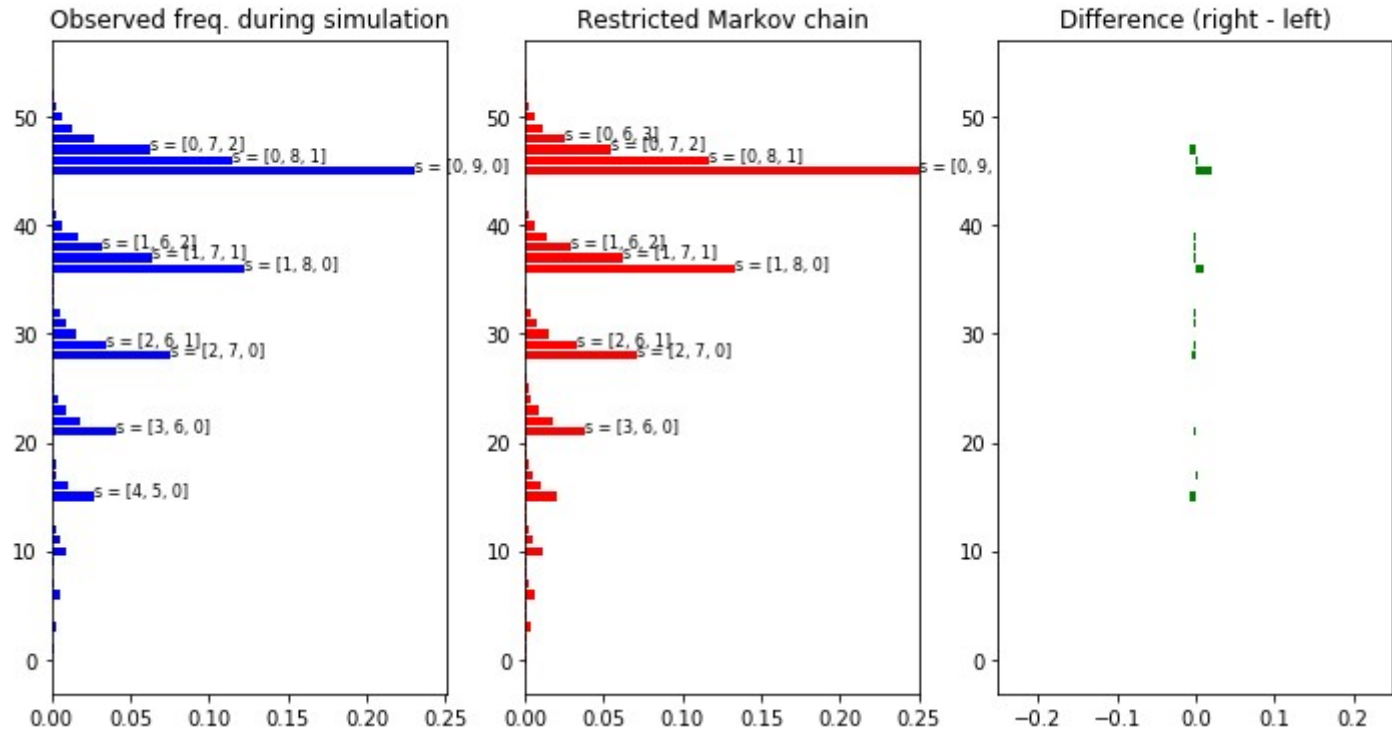


Distribution of ACTIVATION states

# Distribution of ABSORPTION states



| Observed freq. during simulation | Restricted Markov chain | Difference (right - left) |

K=20, rhos=[0.4, 0.75, 0.35], N=800, activation size=10, maxtime(1)=57142.9, maxtime(N)=71.4, mean_lifetime=21.5(n=2650), finalize=ABS, seed=1
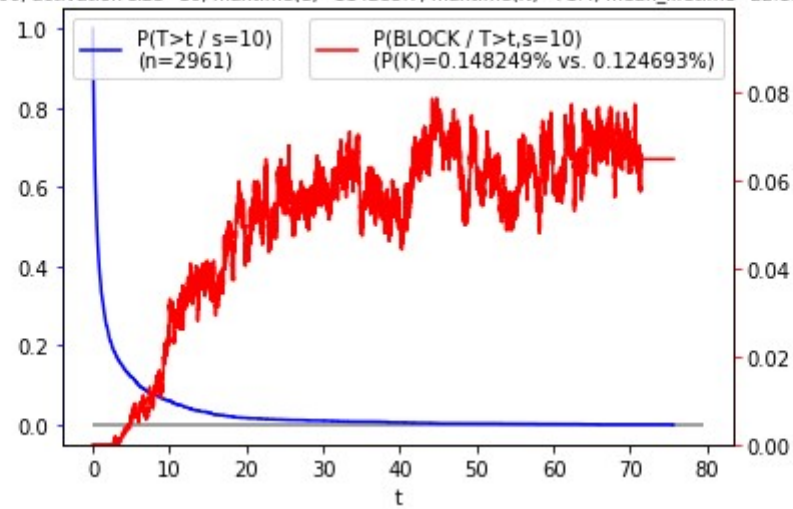
P(T>t / s=10)
(n=1459)

P(BLOCK / T>t,s=10)
(P(K)=0.176276% vs. 0.124693%)

Distribution of ACTIVATION states

Distribution of ABSORPTION states

Distribution of ACTIVATION states

# Distribution of ABSORPTION states



| Observed freq. during simulation | Restricted Markov chain | Difference (right - left) |

K=20, rhos=[0.4, 0.75, 0.35], N=1600, activation size=10, maxtime(1)=114285.7, maxtime(N)=71.4, mean_lifetime=22.1(n=5180), finalize=ABS, seed=
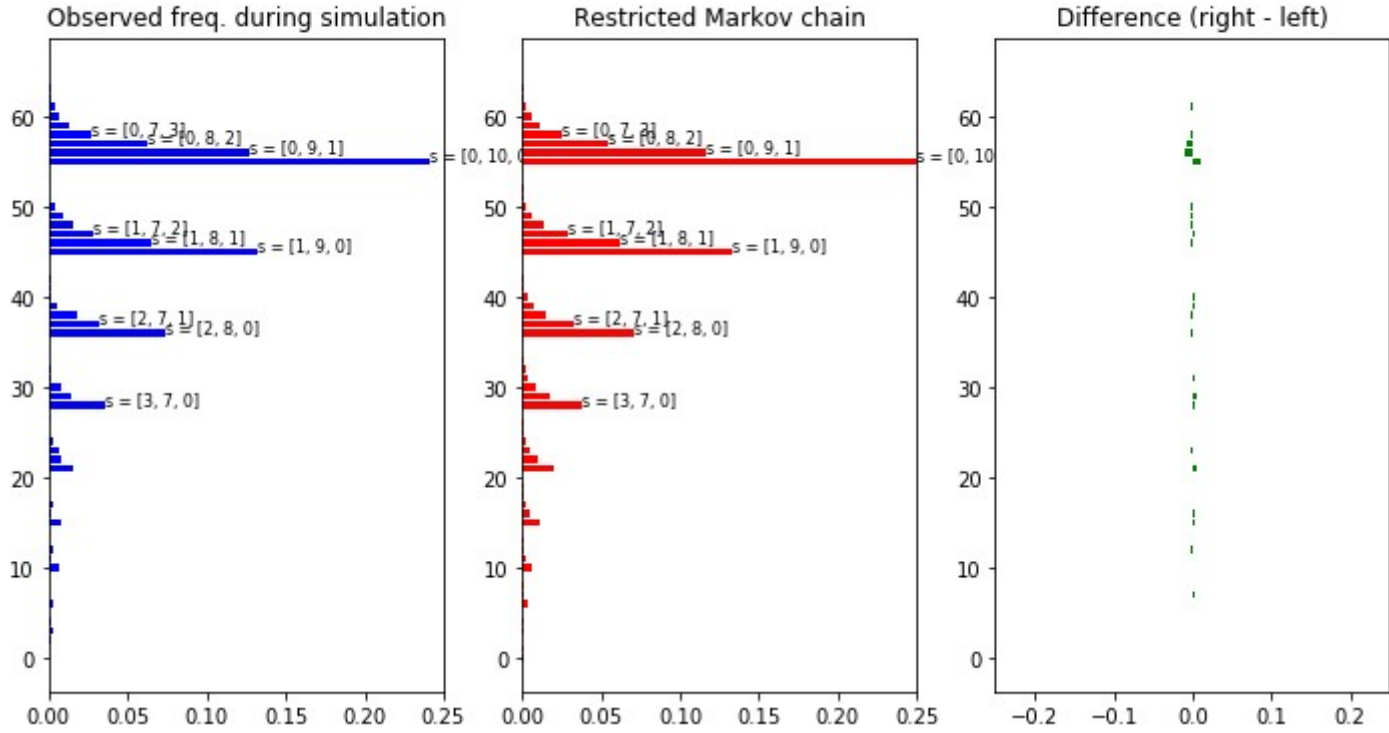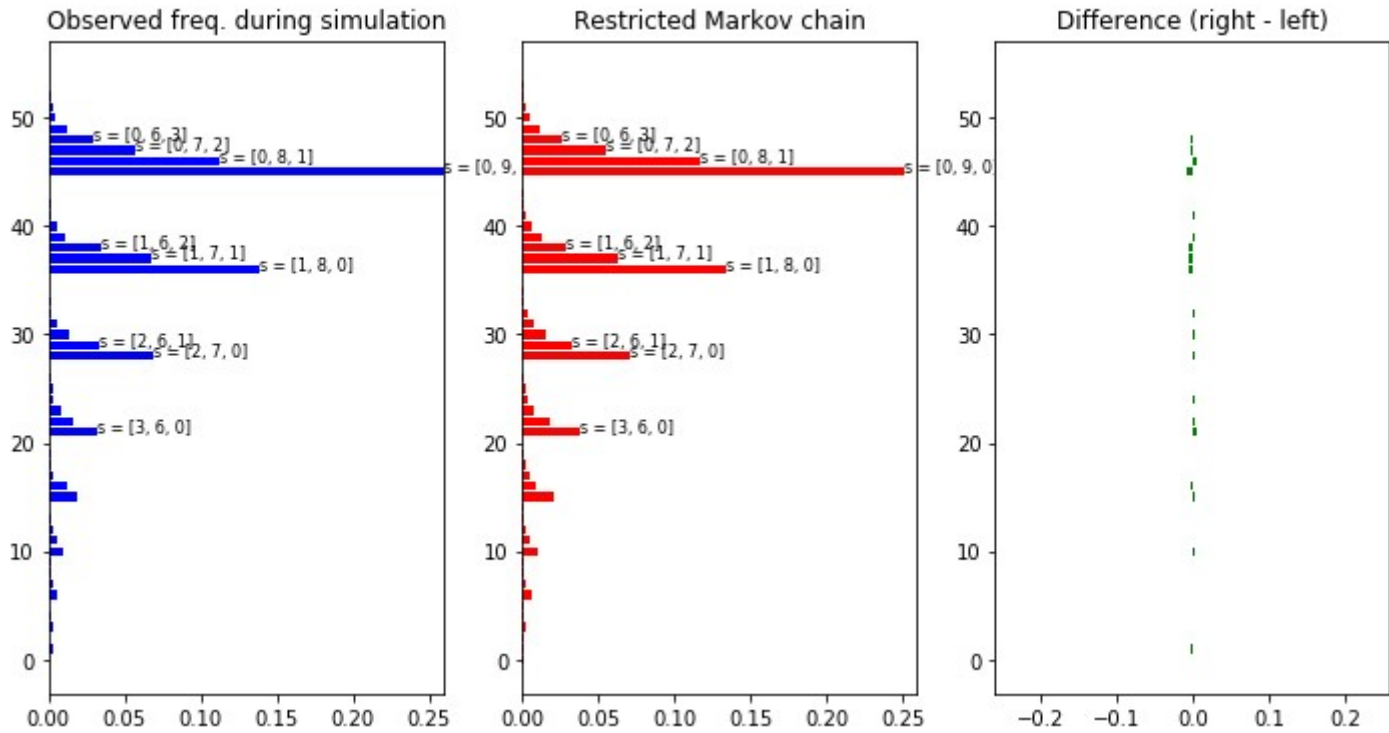
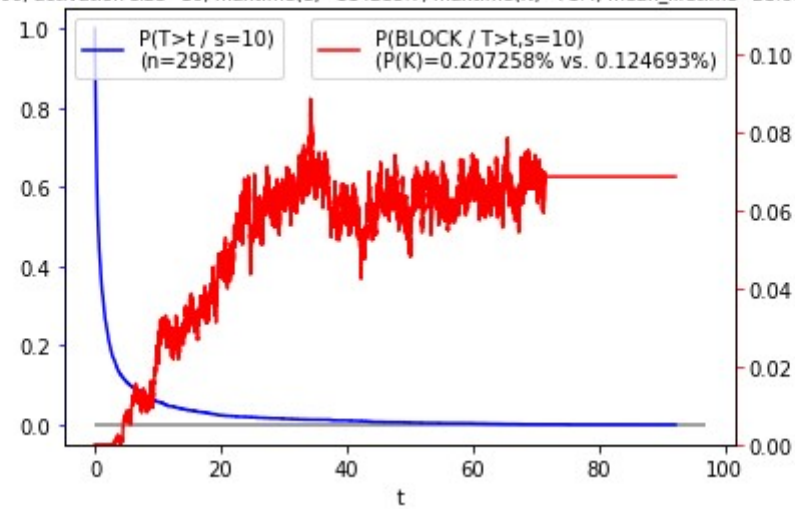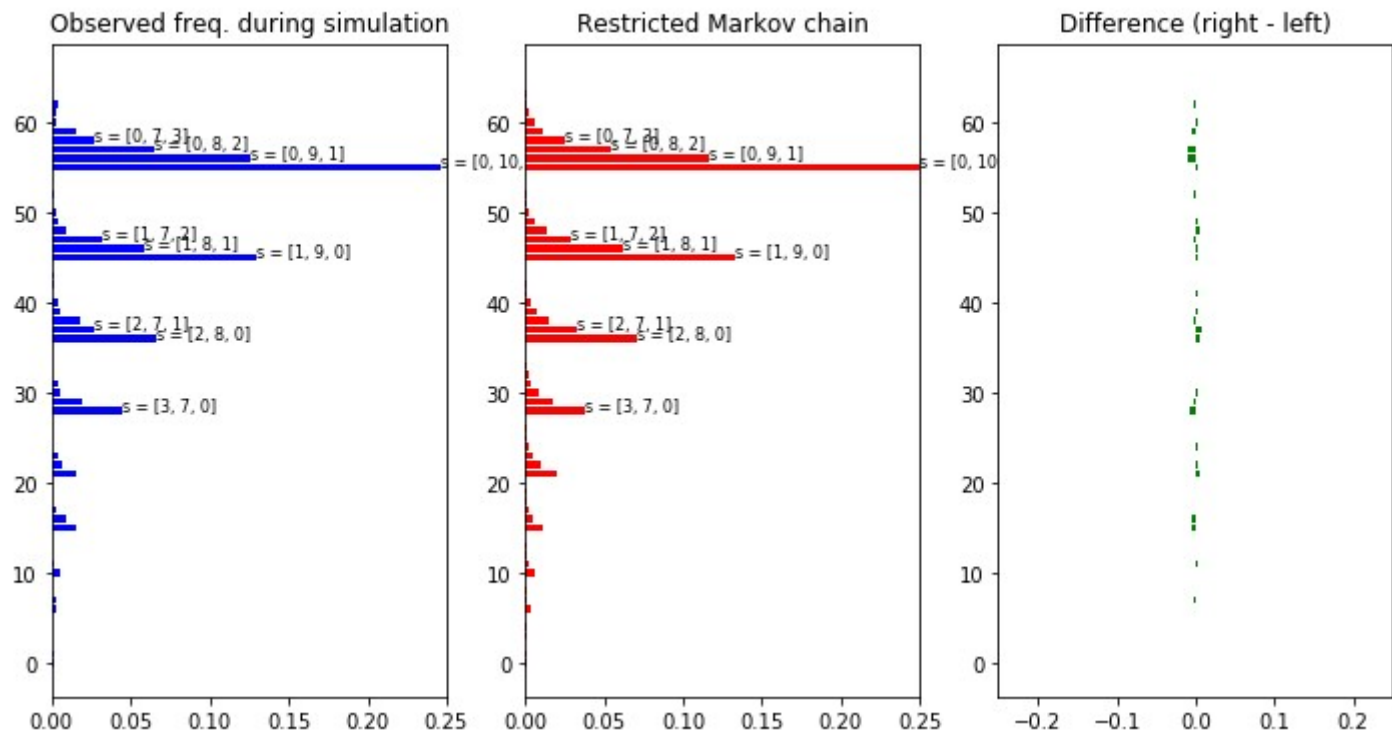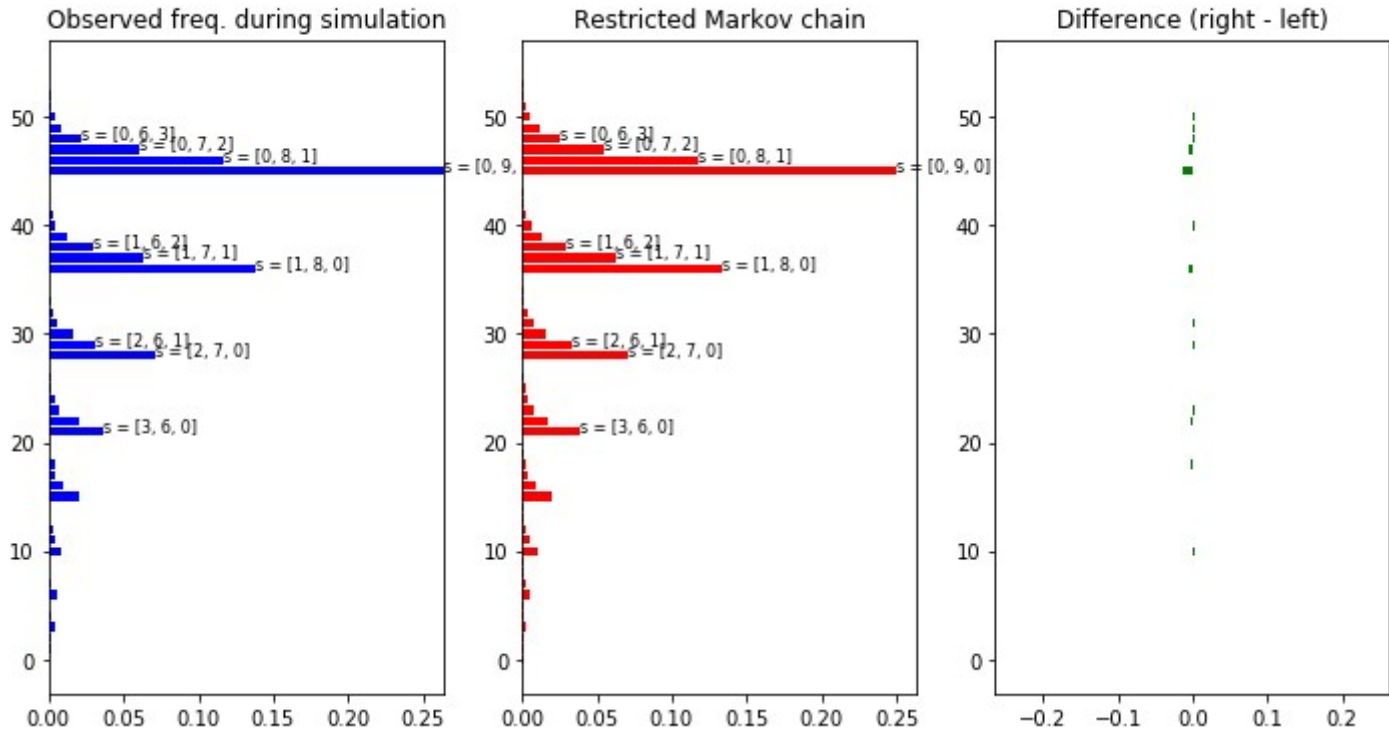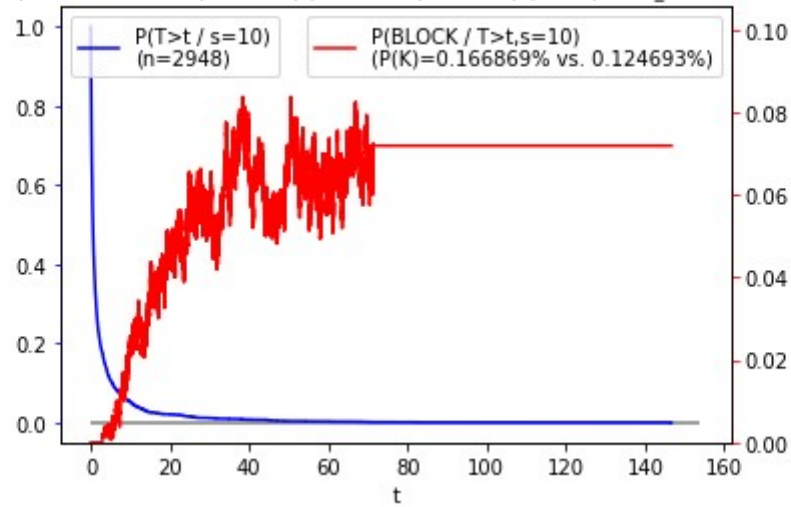# Distribution of ACTIVATION states

## Observed freq. during simulation

s = [0, 7, 3]
s = [0, 8, 2]
s = [0, 9, 1]
s = [0, 10, 0]

s = [1, 7, 2]
s = [1, 8, 1]
s = [1, 9, 0]

s = [2, 7, 1]
s = [2, 8, 0]

s = [3, 7, 0]

## Restricted Markov chain

s = [0, 7, 3]
s = [0, 8, 2]
s = [0, 9, 1]
s = [0, 10, 0]

s = [1, 7, 2]
s = [1, 8, 1]
s = [1, 9, 0]

s = [2, 7, 1]
s = [2, 8, 0]

s = [3, 7, 0]

## Difference (right - left)

# Distribution of ABSORPTION states

## Observed freq. during simulation

s = [0, 6, 3]
s = [0, 7, 2]
s = [0, 8, 1]
s = [0, 9,

s = [1, 6, 2]
s = [1, 7, 1]
s = [1, 8, 0]

s = [2, 6, 1]
s = [2, 7, 0]

s = [3, 6, 0]

## Restricted Markov chain

s = [0, 6, 3]
s = [0, 7, 2]
s = [0, 8, 1]
s = [0, 9, 0]

s = [1, 6, 2]
s = [1, 7, 1]
s = [1, 8, 0]

s = [2, 6, 1]
s = [2, 7, 0]

s = [3, 6, 0]

## Difference (right - left)

K=20, rhos=[0.4, 0.75, 0.35], N=1600, activation size=10, maxtime(1)=114285.7, maxtime(N)=71.4, mean_lifetime=21.6(n=5297), finalize=ABS, seed=
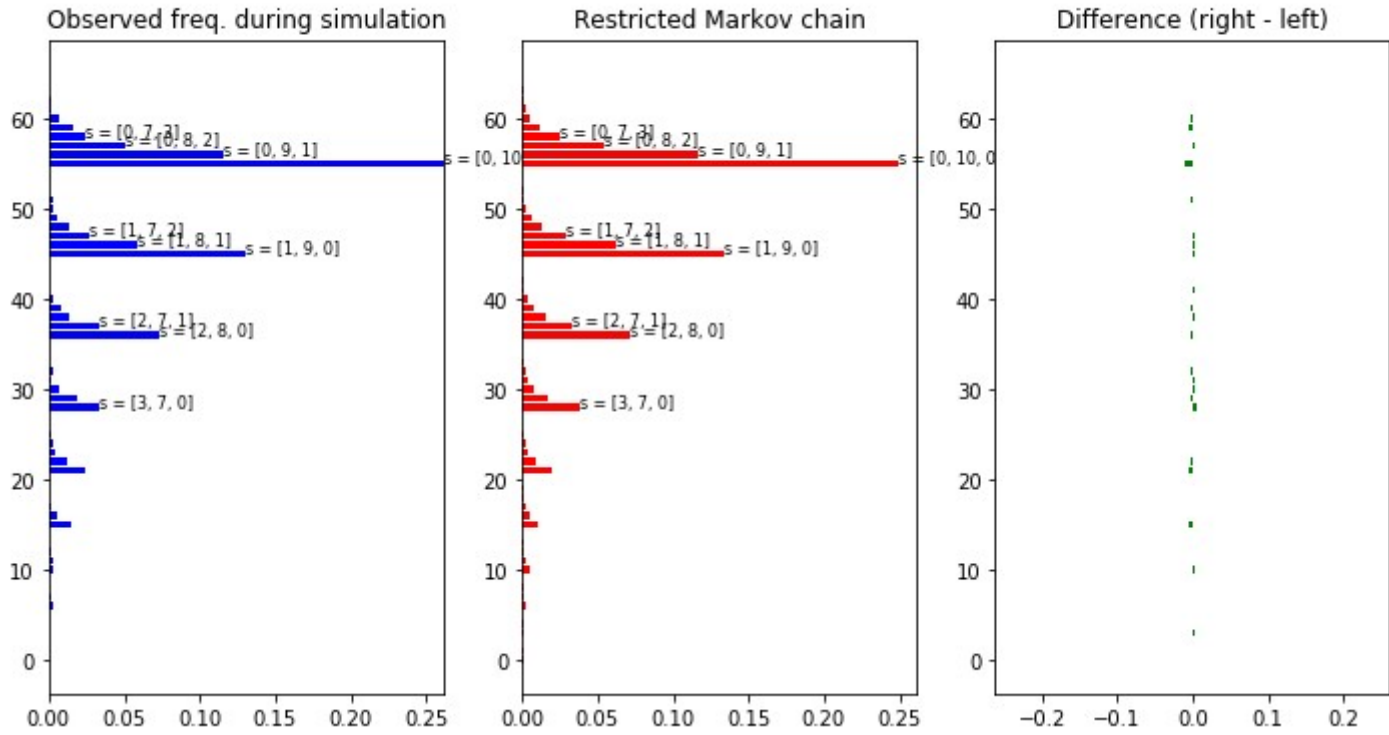
Distribution of ACTIVATION states
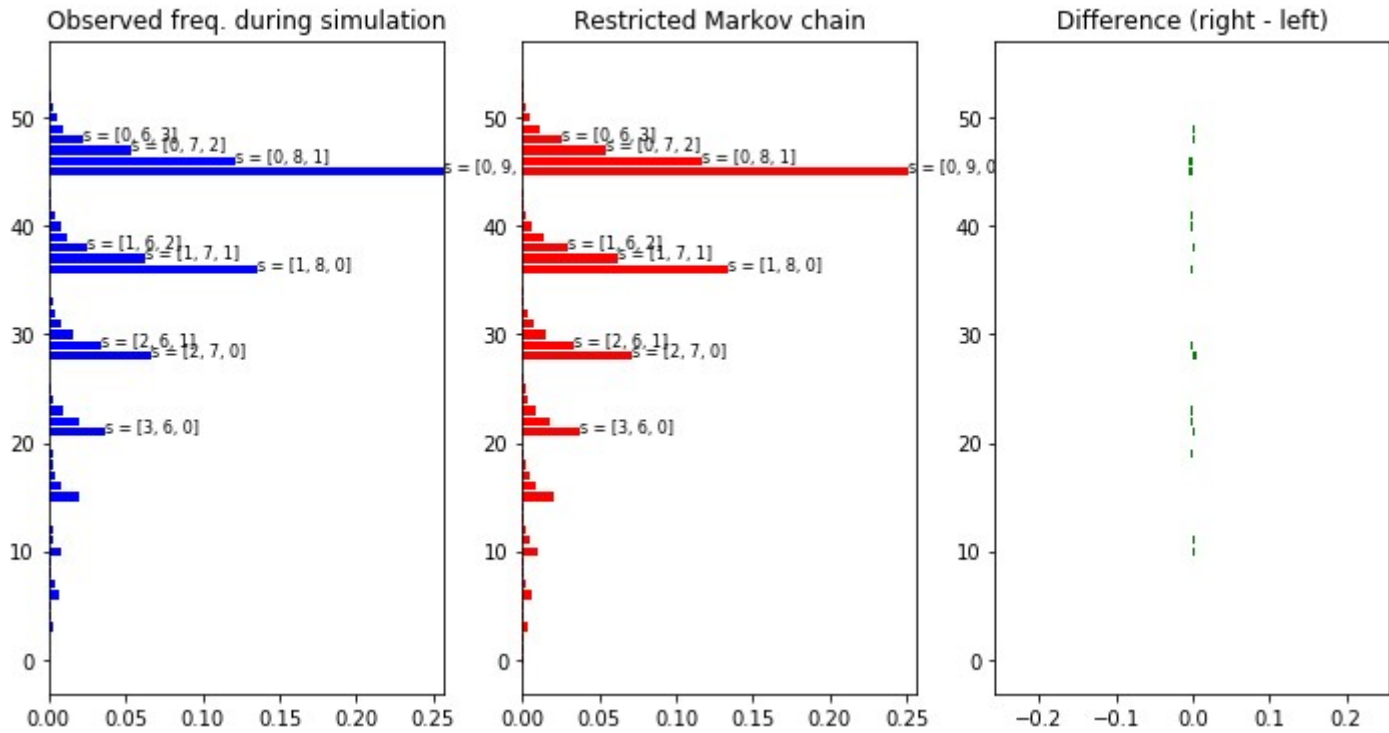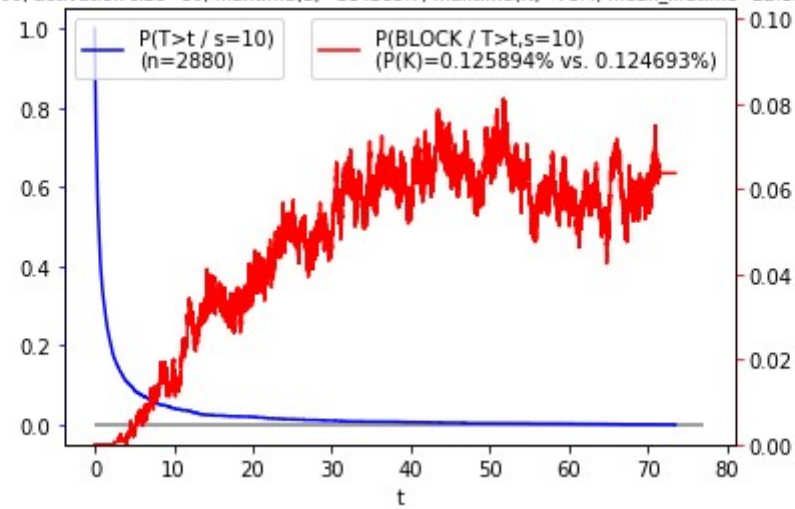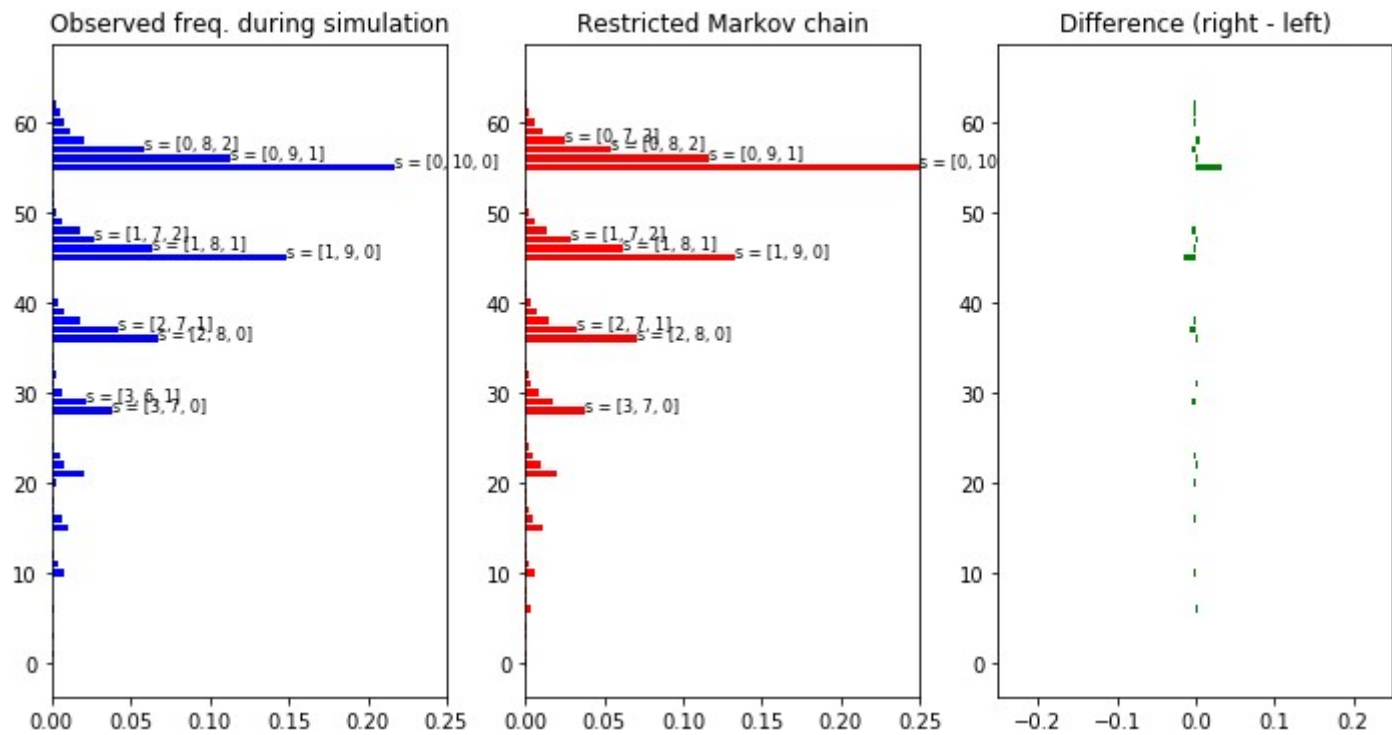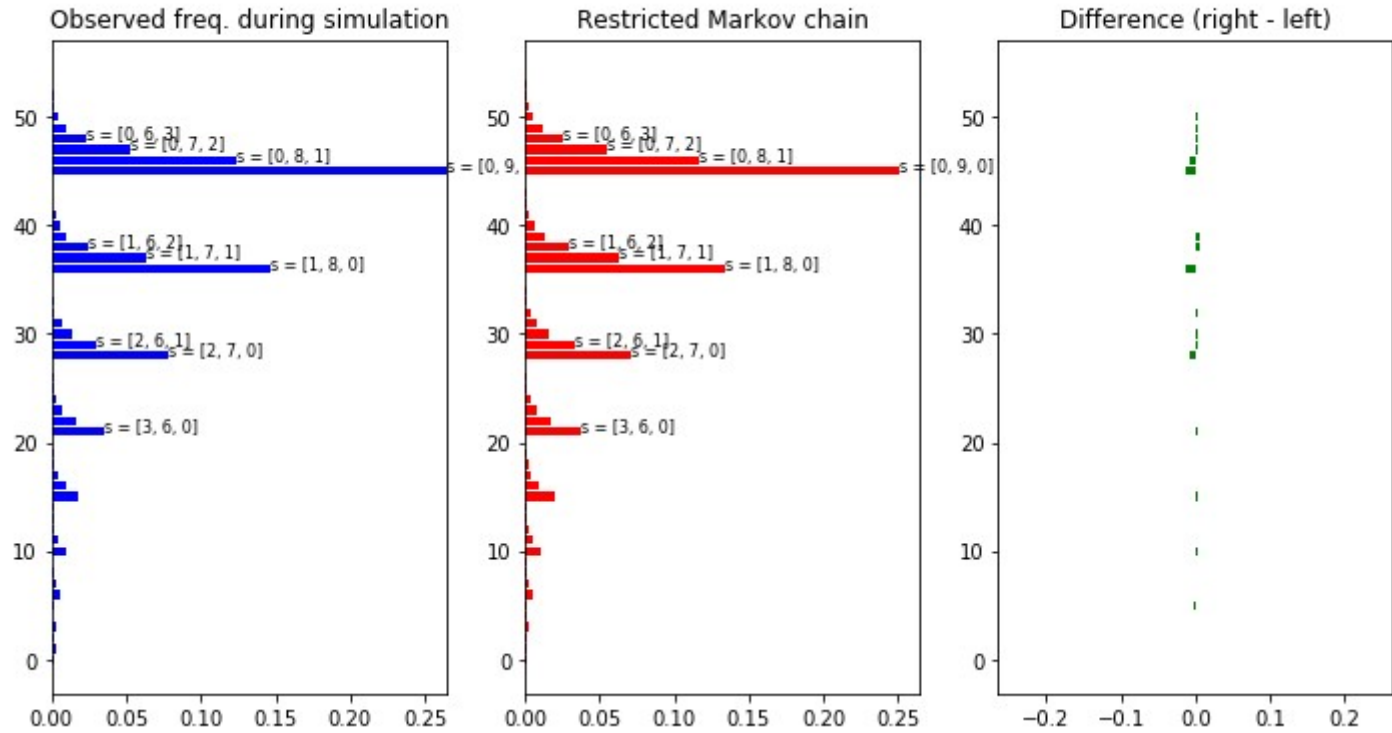
# Distribution of ABSORPTION states

## Observed freq. during simulation | Restricted Markov chain | Difference (right - left)



K=20, rhos=[0.4, 0.75, 0.35], N=1600, activation size=10, maxtime(1)=114285.7, maxtime(N)=71.4, mean_lifetime=22.8(n=5016), finalize=ABS, seed=
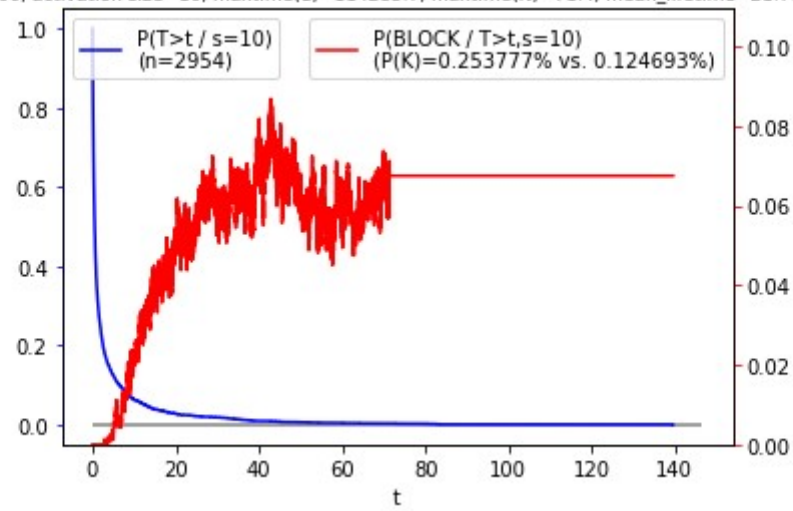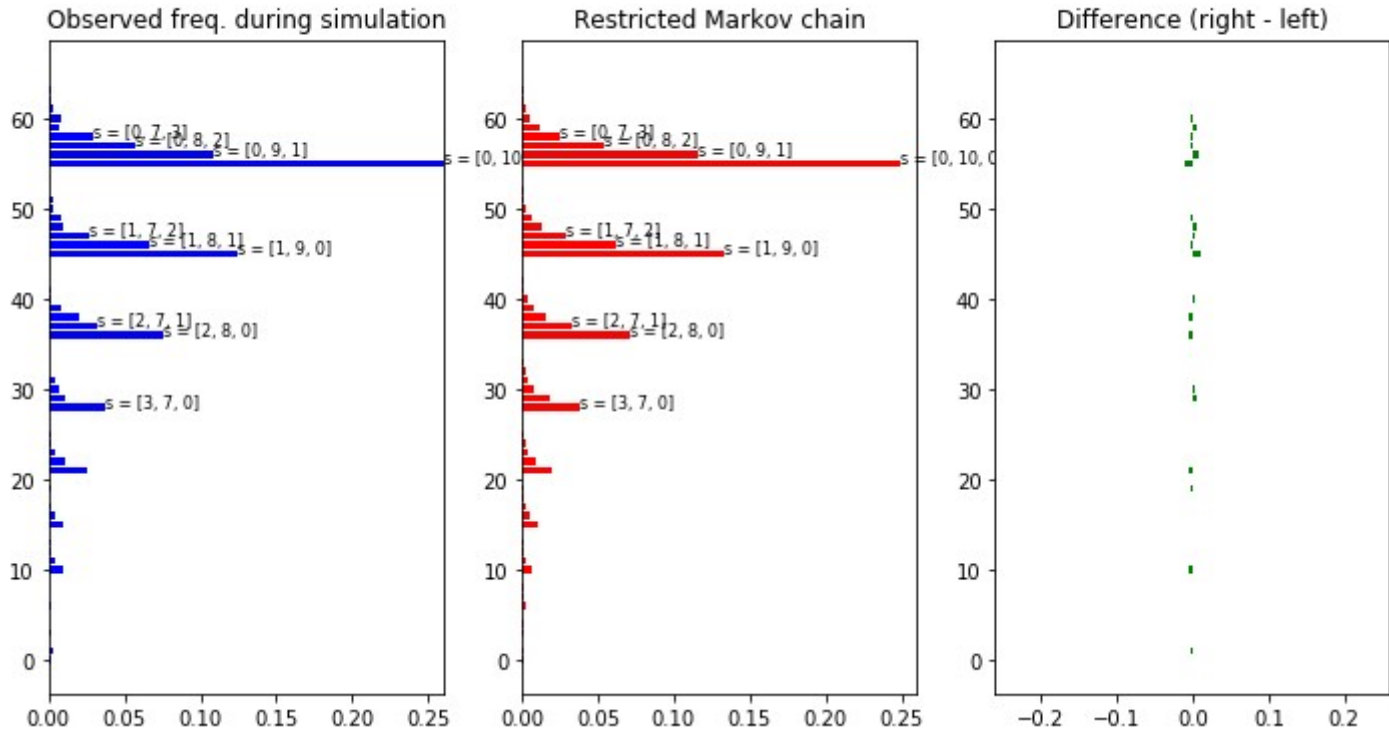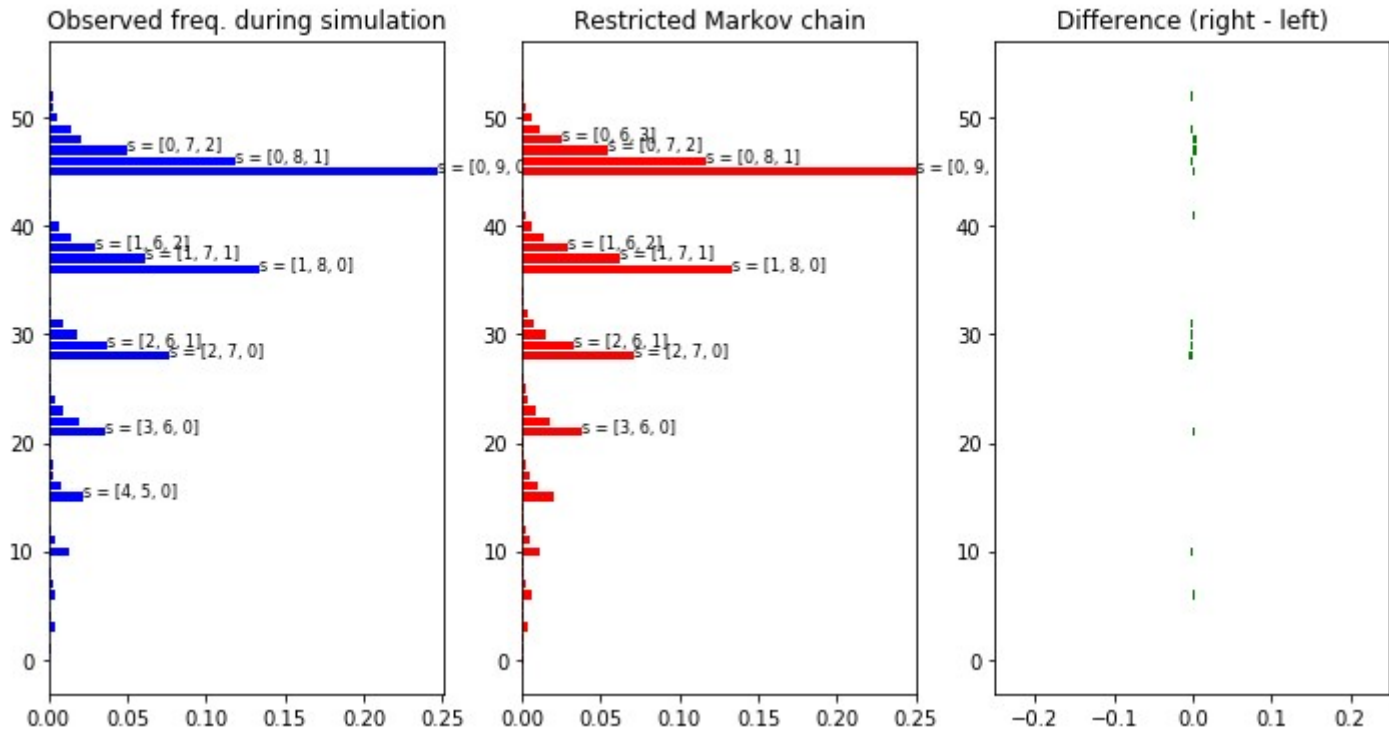
Distribution of ACTIVATION states

Observed freq. during simulation | Restricted Markov chain | Difference (right - left)

Distribution of ABSORPTION states

Observed freq. during simulation | Restricted Markov chain | Difference (right - left)

K=20, rhos=[0.4, 0.75, 0.35], N=1600, activation size=10, maxtime(1)=114285.7, maxtime(N)=71.4, mean_lifetime=22.1(n=5159), finalize=ABS, seed=
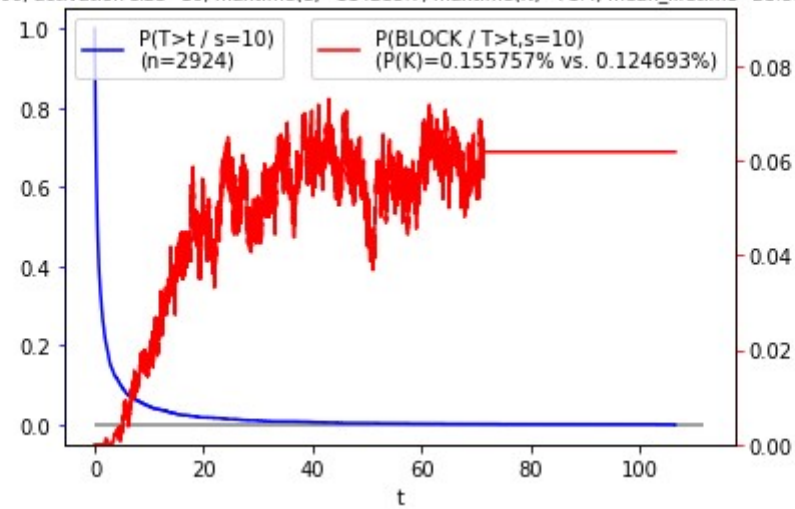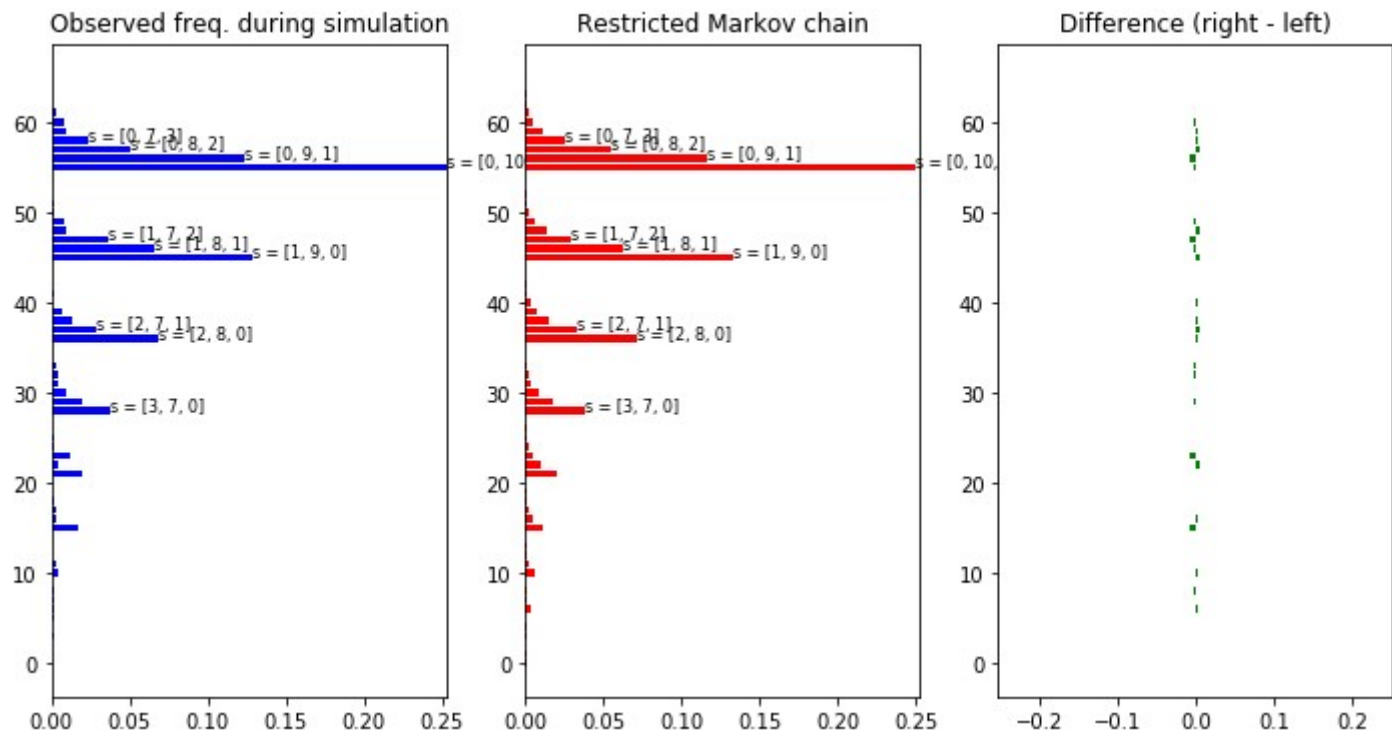


Distribution of ACTIVATION states

# Distribution of ABSORPTION states



Observed freq. during simulation | Restricted Markov chain | Difference (right - left)

K=20, rhos=[0.4, 0.75, 0.35], N=1600, activation size=10, maxtime(1)=114285.7, maxtime(N)=71.4, mean_lifetime=21.7(n=5264), finalize=ABS, seed=

Distribution of ACTIVATION states
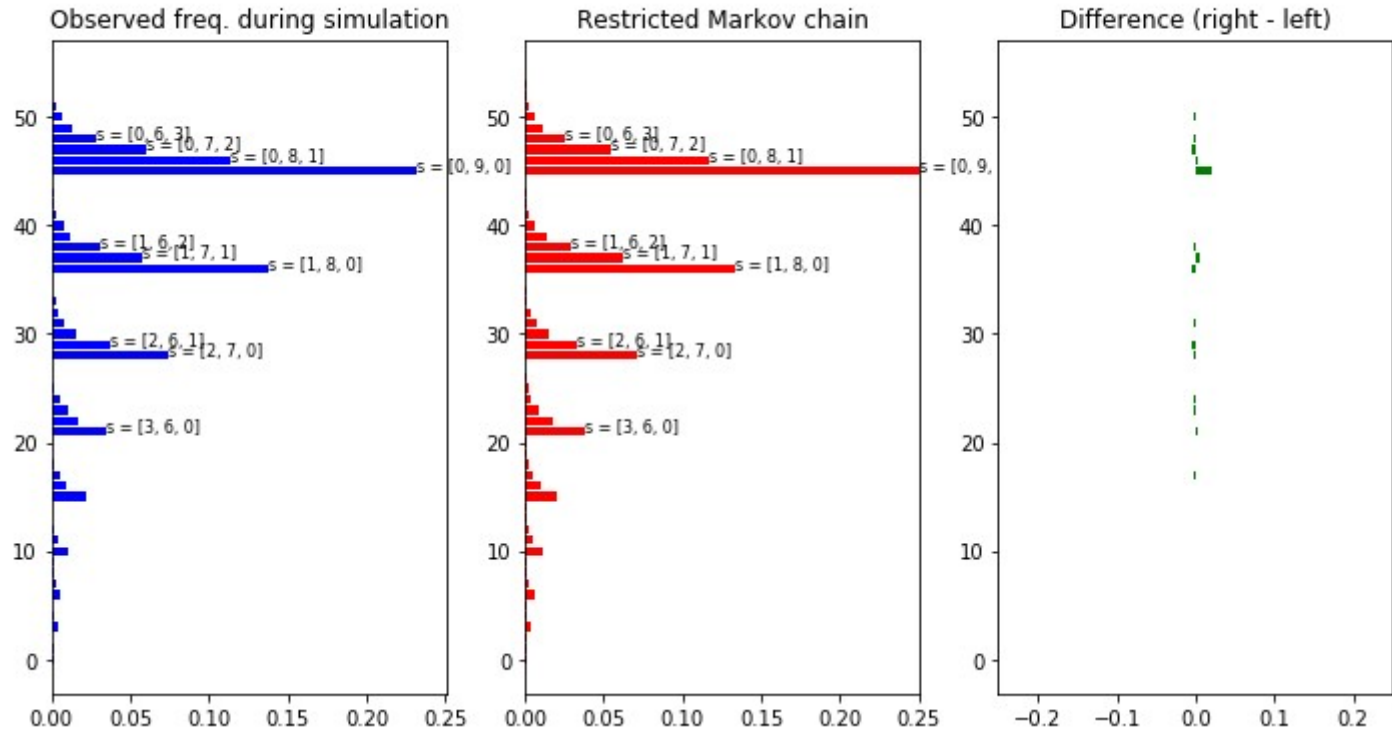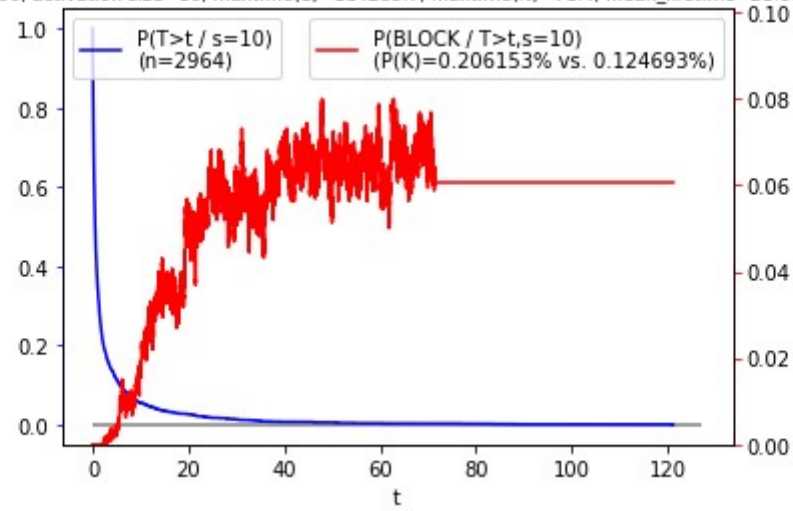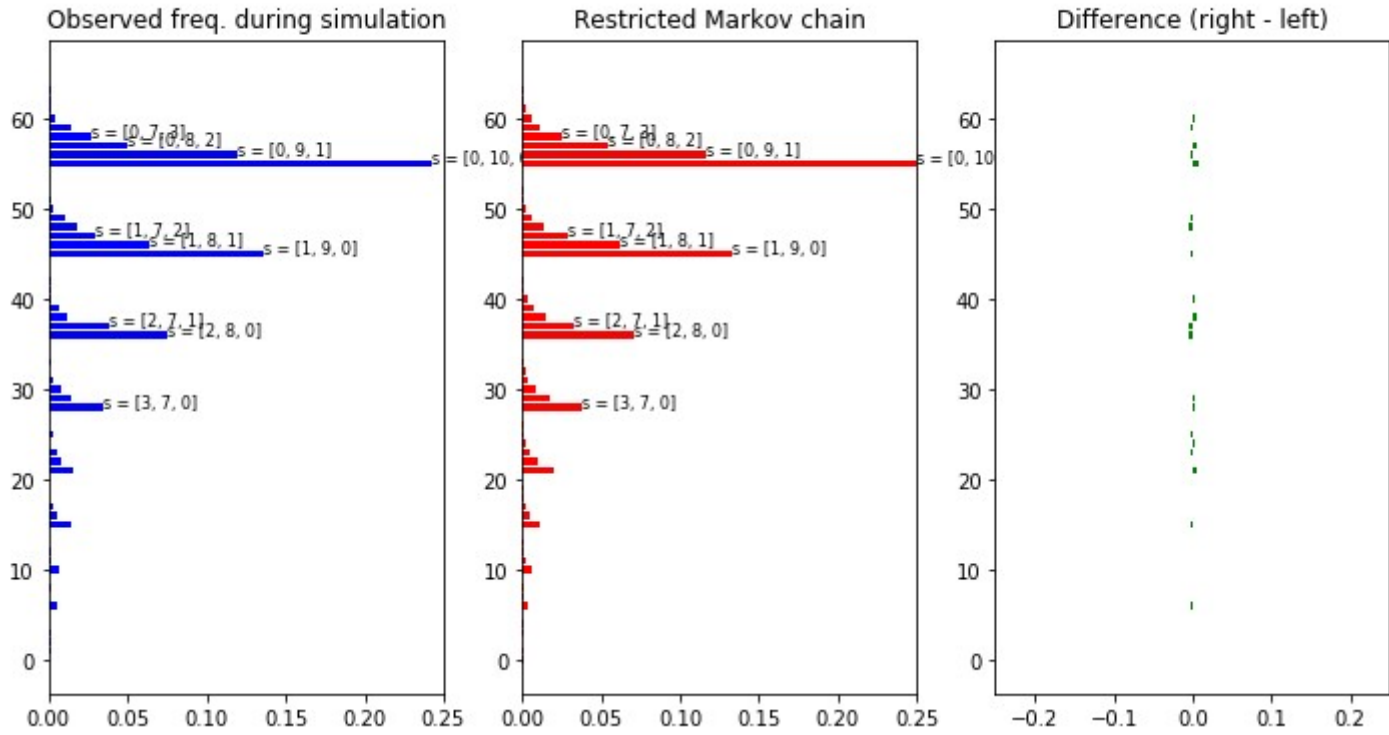
Distribution of ABSORPTION states

Distribution of ACTIVATION states

# Distribution of ABSORPTION states



Observed freq. during simulation | Restricted Markov chain | Difference (right - left)
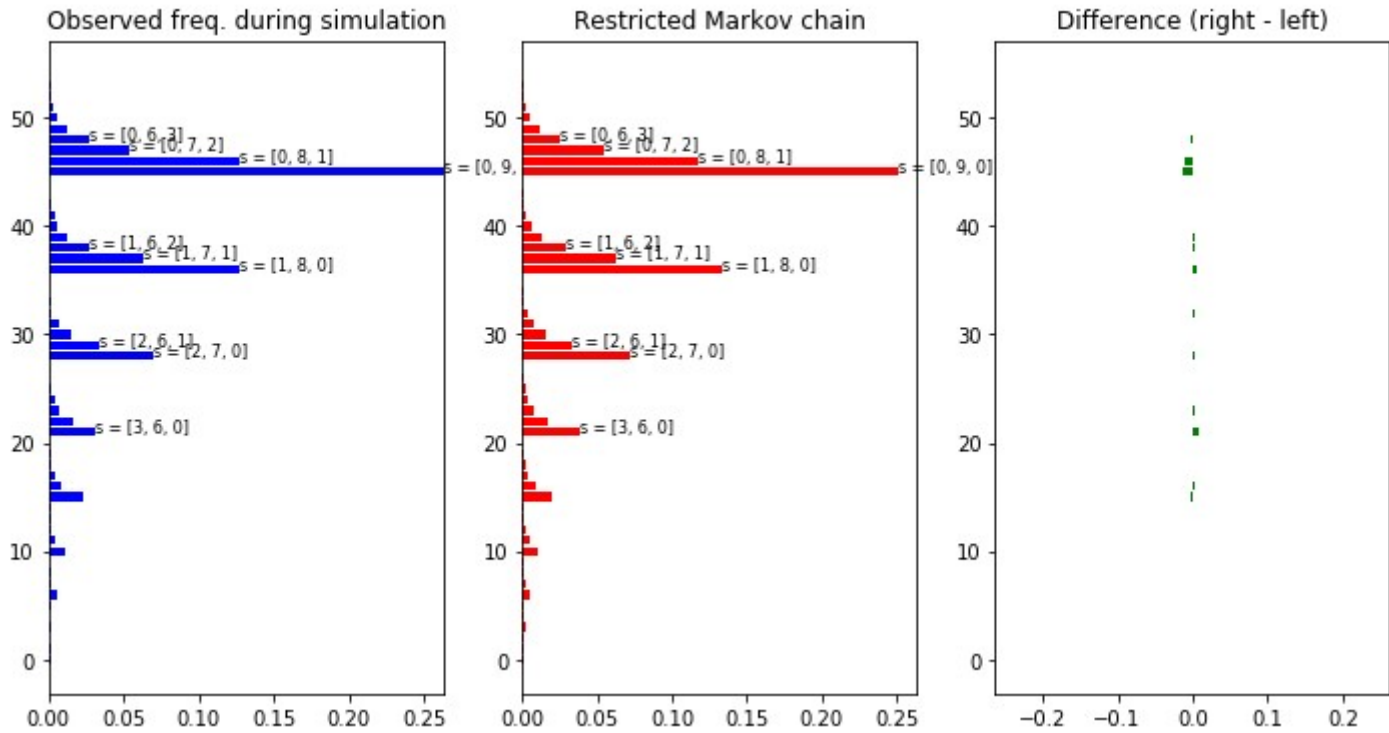
K=20, rhos=[0.4, 0.75, 0.35], N=1600, activation size=10, maxtime(1)=114285.7, maxtime(N)=71.4, mean_lifetime=21.6(n=5289), finalize=ABS, seed=
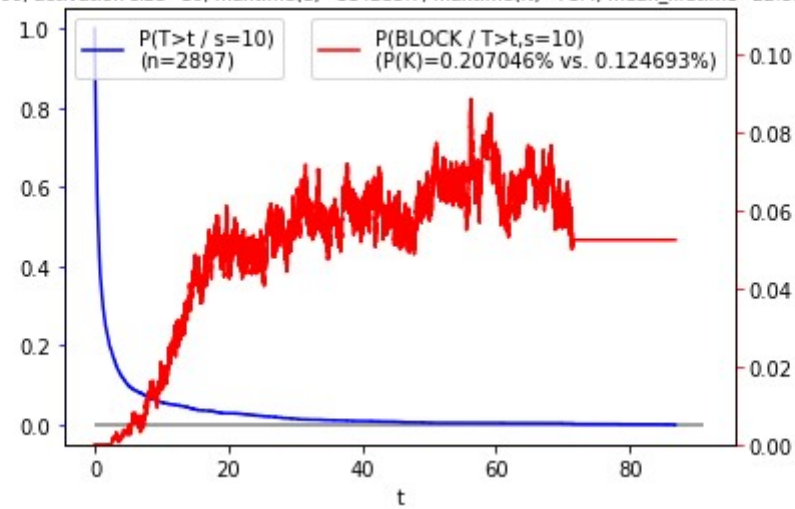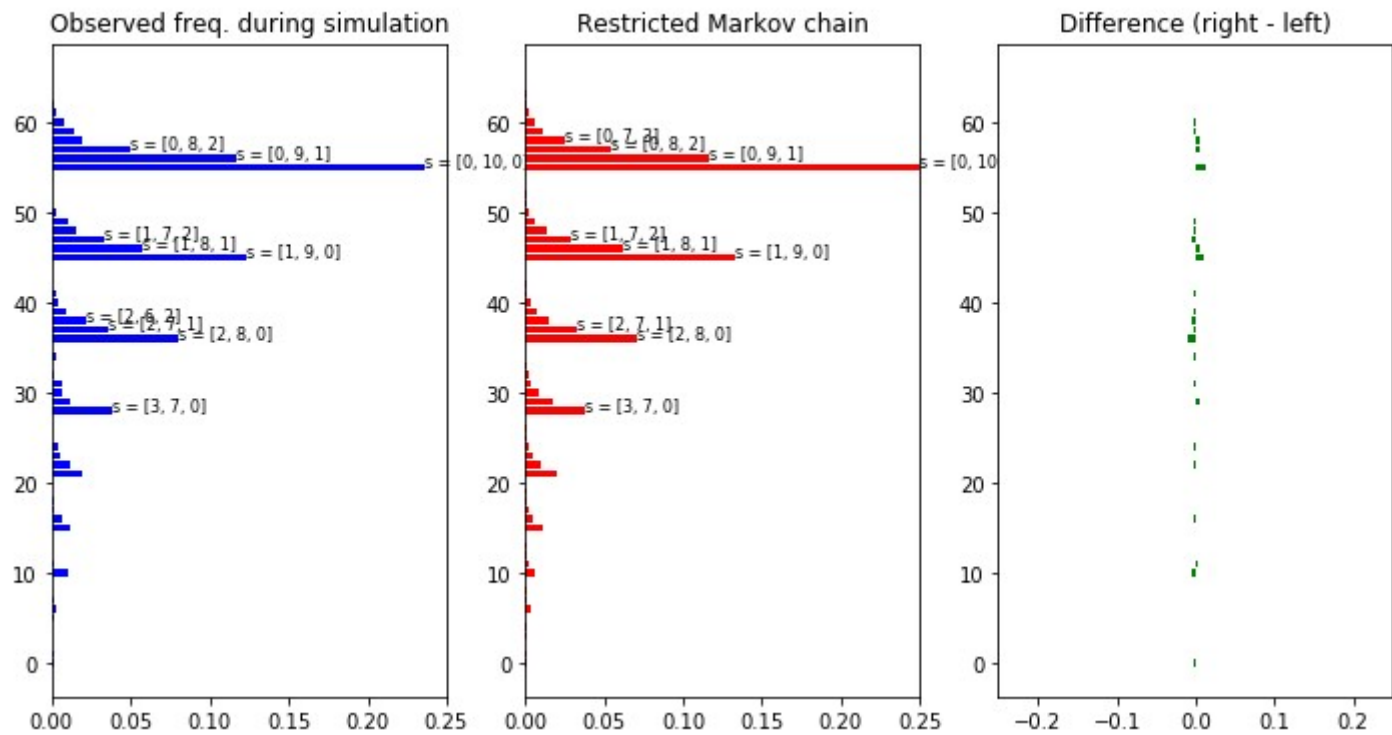
Distribution of ACTIVATION states
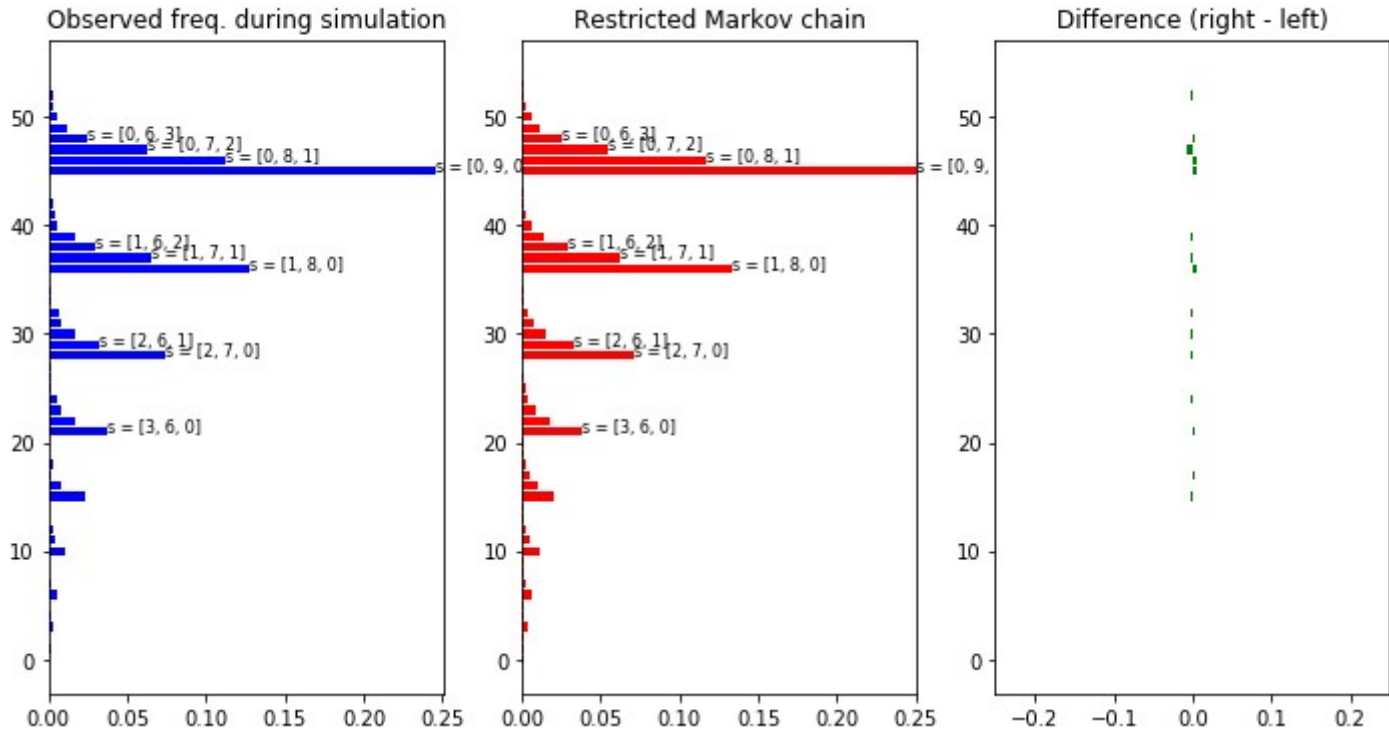
Distribution of ABSORPTION states

K=20, rhos=[0.4, 0.75, 0.35], N=1600, activation size=10, maxtime(1)=114285.7, maxtime(N)=71.4, mean_lifetime=22.8(n=5009), finalize=ABS, seed=
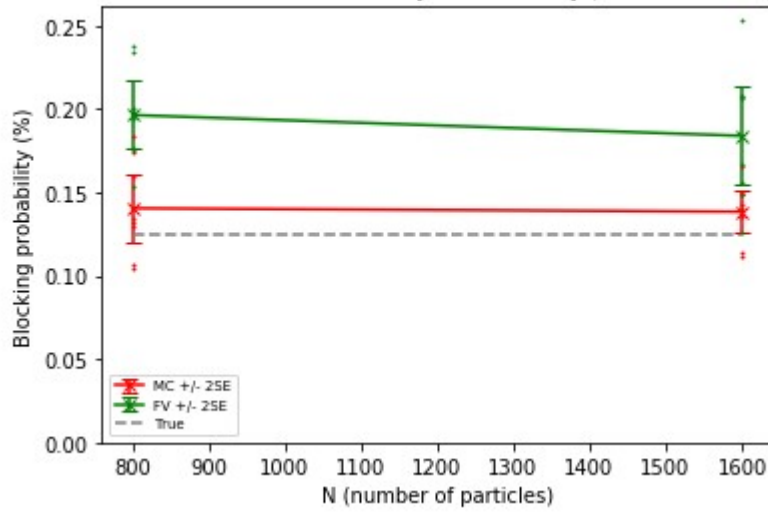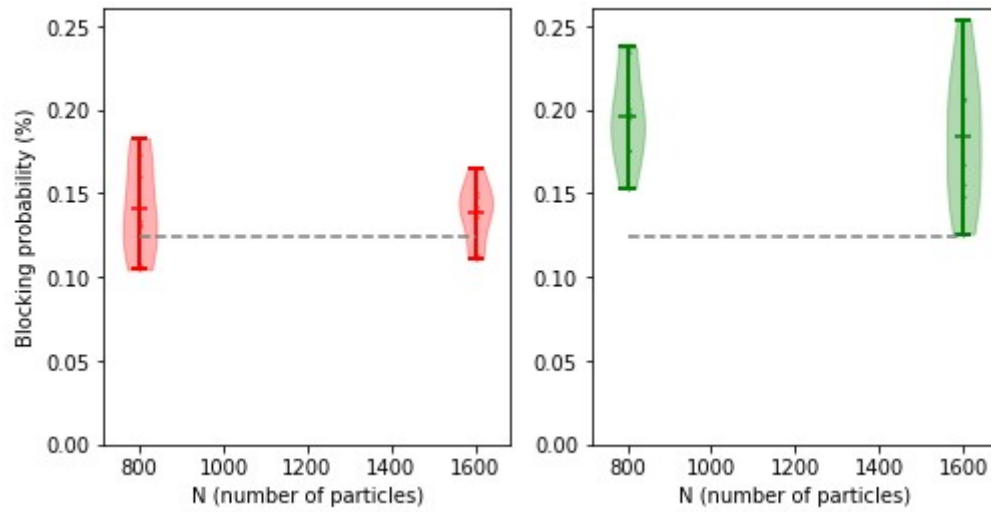
Distribution of ACTIVATION states

# Distribution of ABSORPTION states



| Observed freq. during simulation | Restricted Markov chain | Difference (right - left) |

Simulation results for #servers=3, K=20, rhos=[0.4, 0.75, 0.35], (800<=N<=1600), T<=71, Rep=8

Simulation results for #servers=3, K=20, rhos=[0.4, 0.75, 0.35], (800<=N<=1600), T<=71, Rep=8



In [2]: