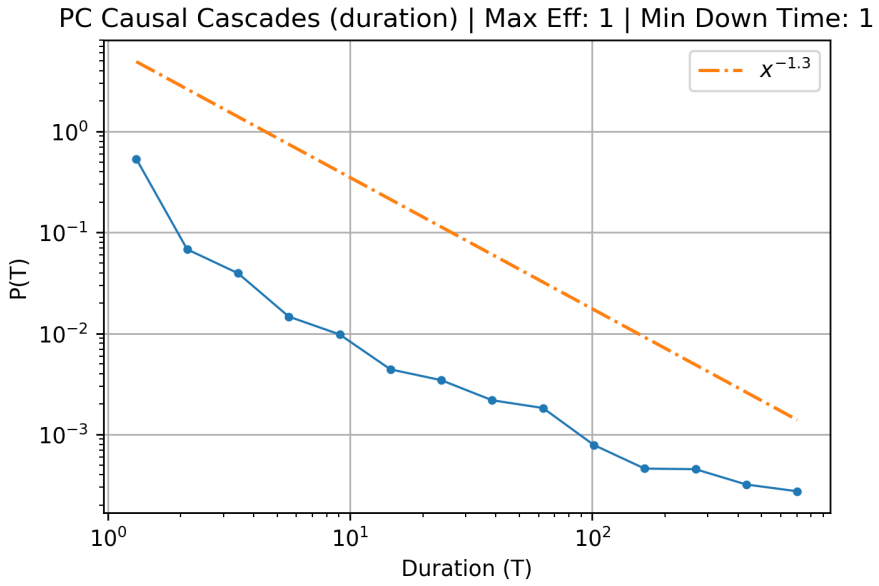
Nov 18 Price Change (PC) vs No Price Change Simulations (NPC)

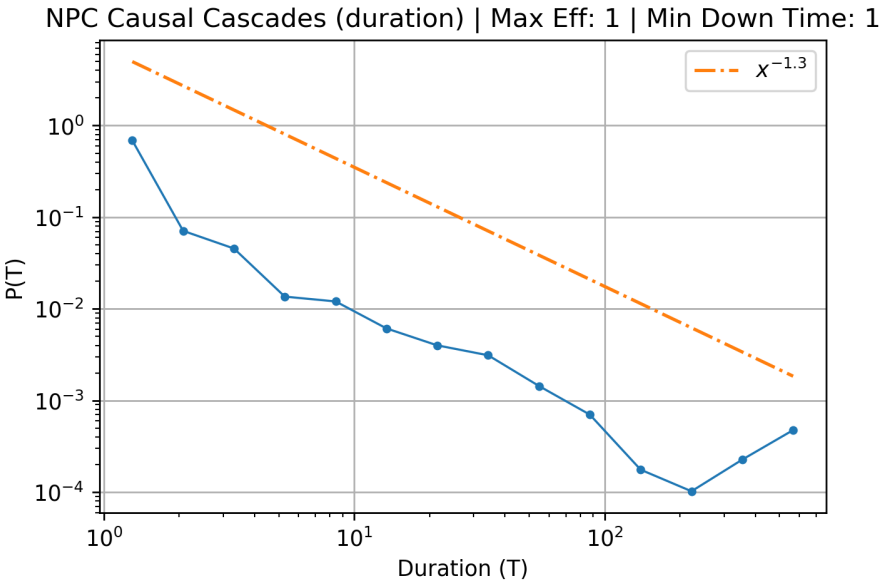
Braedyn Au

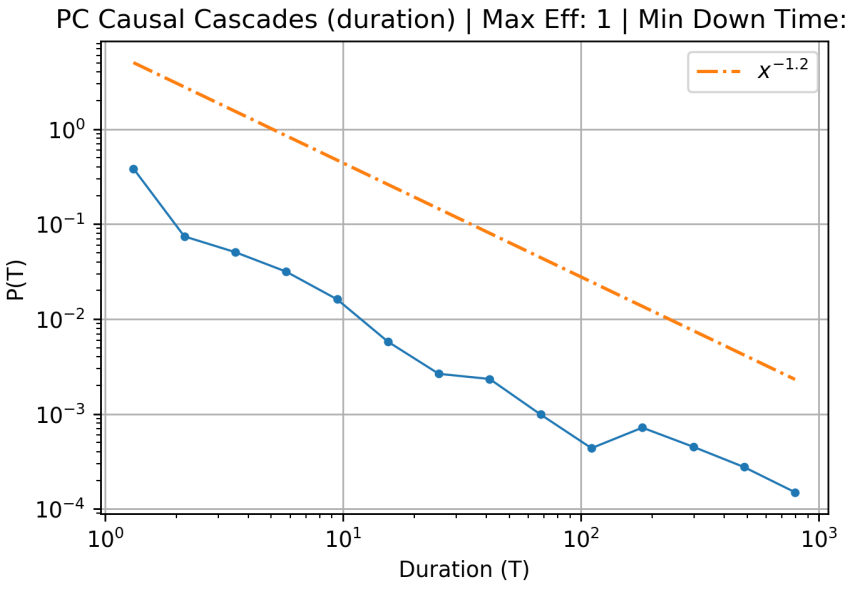
- All simulated with 1000 traders, 100 stocks, for 1000 time steps using the same algorithms
- Price Change (PC): change in Hurst index of stock proportional to number of stocks moved
- No price change (NPC): constant Hurst index
- Causal Cascades: algortihm that traces trading activity from one portfolio to another based on trading overlapping stocks
- Stock Cascades: temporally seperated cascades of an individual stock, with all stock cascades compiled in these distributions

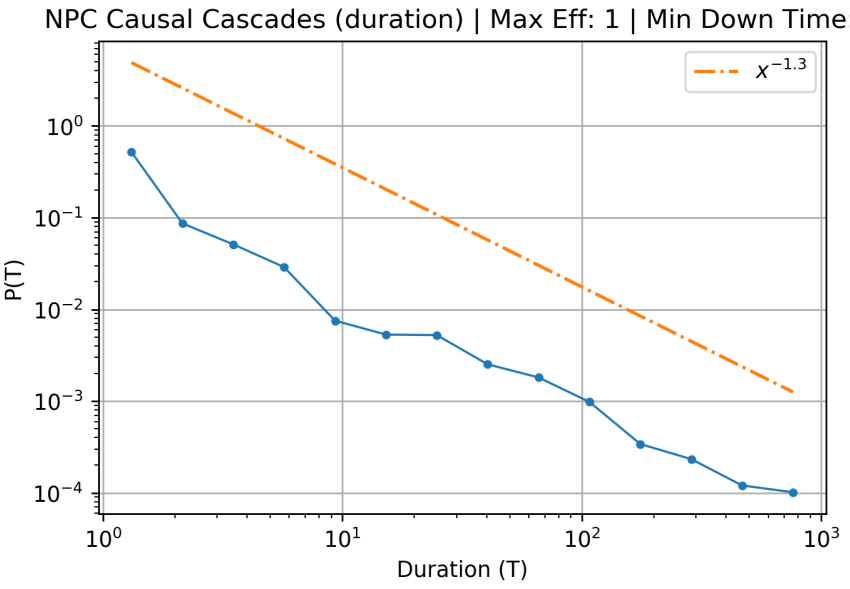
- Maximum time effect (Max Eff): maximum time a single trading event can impact other trades to be considered part of the same cascade
- Minimum down time: minimum amount of queissence time for a cascade to end

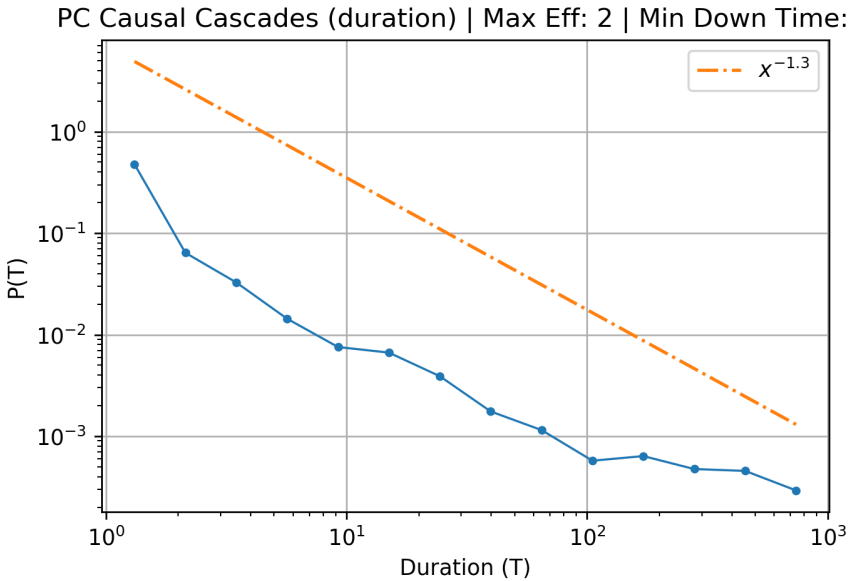
Causal Cascades

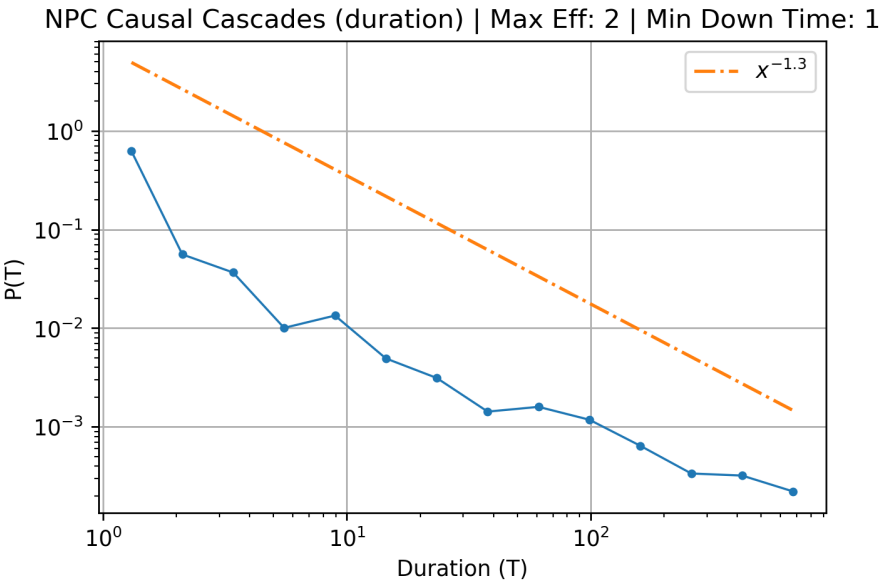


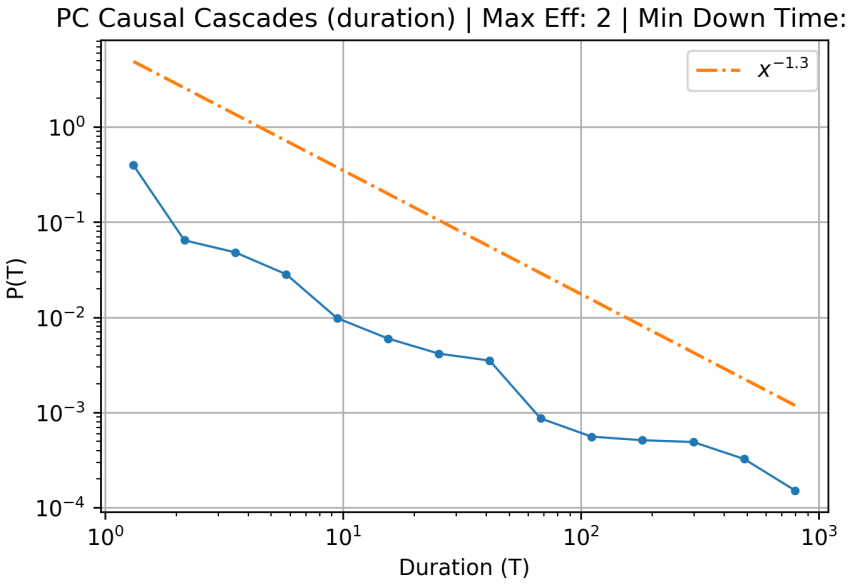


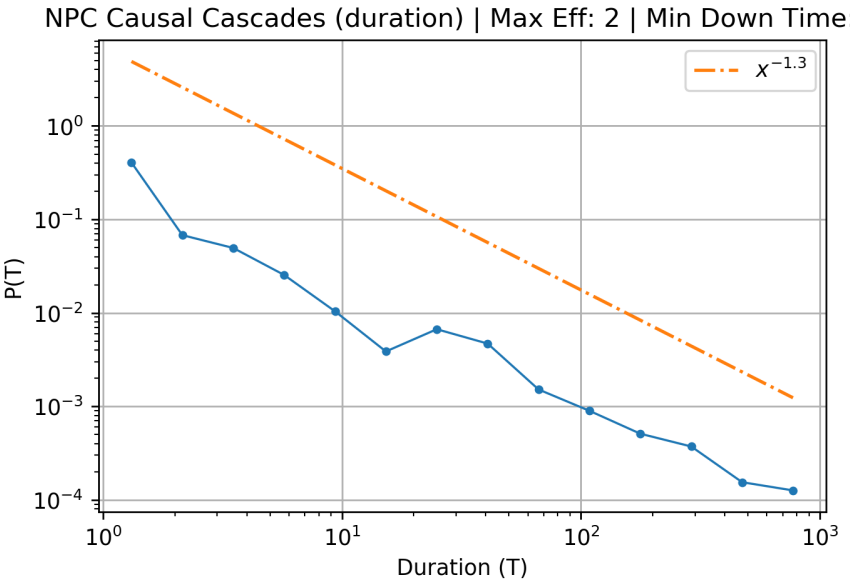

PC Causal Cascades (duration) | Max Eff: 1 | Min Down Time: 2
$x^{-1.2}$
P(T)
Duration (T)
10^0
10^{-1}
10^{-2}
10^{-3}
10^{-4}
10^0
10^1
10^2
10^3

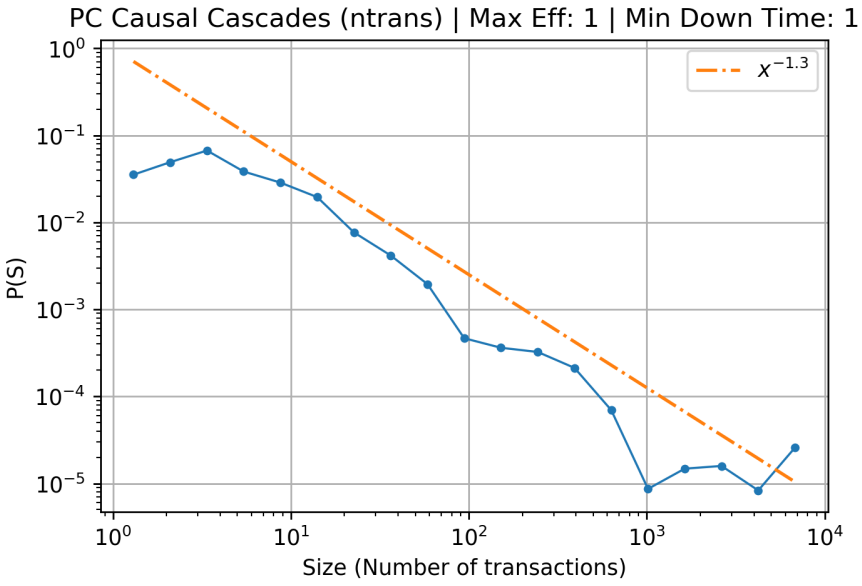

NPC Causal Cascades (duration) | Max Eff: 1 | Min Down Time: 2
$x^{-1.3}$
P(T)
Duration (T)
10^0
10^{-1}
10^{-2}
10^{-3}
10^{-4}
10^0
10^1
10^2
10^3

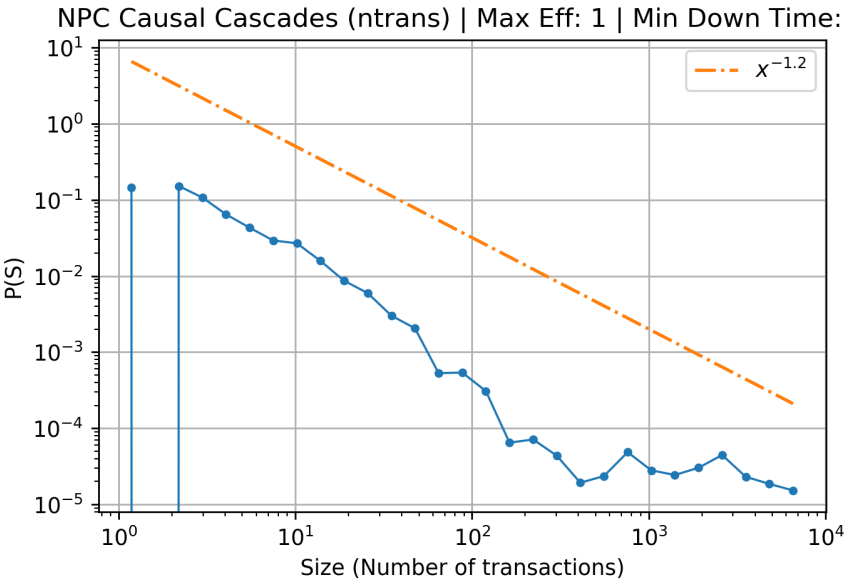

PC Causal Cascades (duration) | Max Eff: 2 | Min Down Time: 1
$x^{-1.3}$
P(T)
Duration (T)
10^0
10^{-1}
10^{-2}
10^{-3}
10^0
10^1
10^2
10^3

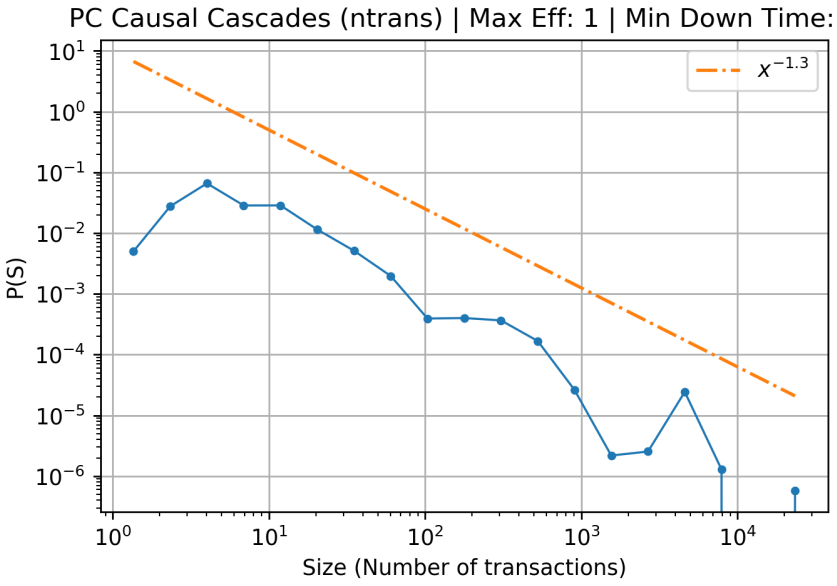

NPC Causal Cascades (duration) | Max Eff: 2 | Min Down Time: 1
$x^{-1.3}$
P(T)
Duration (T)
10^0
10^{-1}
10^{-2}
10^{-3}
10^0
10^1
10^2

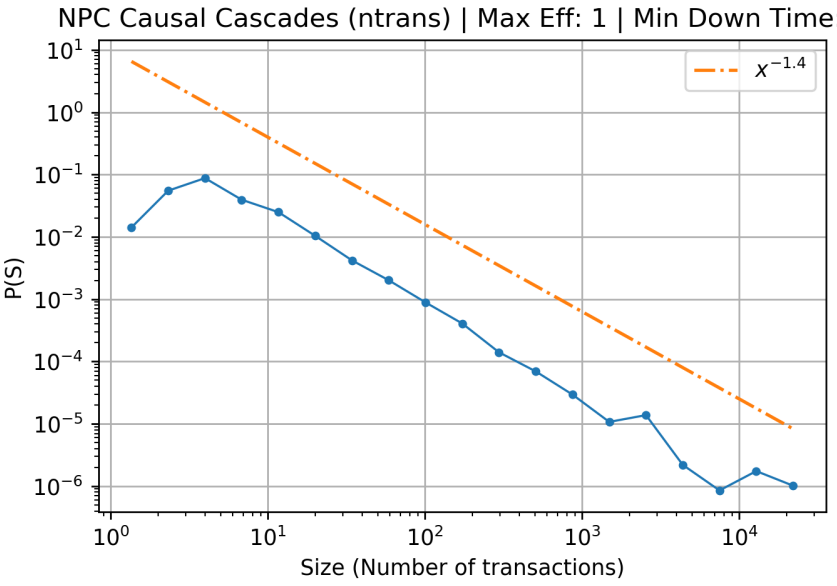

PC Causal Cascades (duration) | Max Eff: 2 | Min Down Time: 2
$x^{-1.3}$
P(T)
Duration (T)
10^0
10^{-1}
10^{-2}
10^{-3}
10^{-4}
10^0
10^1
10^2
10^3

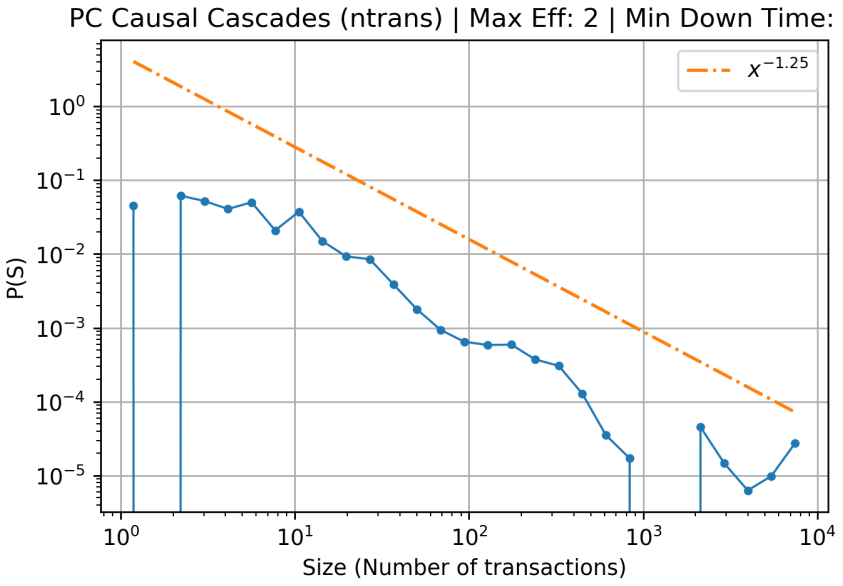

NPC Causal Cascades (duration) | Max Eff: 2 | Min Down Time: 2
$x^{-1.3}$
P(T)
Duration (T)
10^0
10^{-1}
10^{-2}
10^{-3}
10^{-4}
10^0
10^1
10^2
10^3

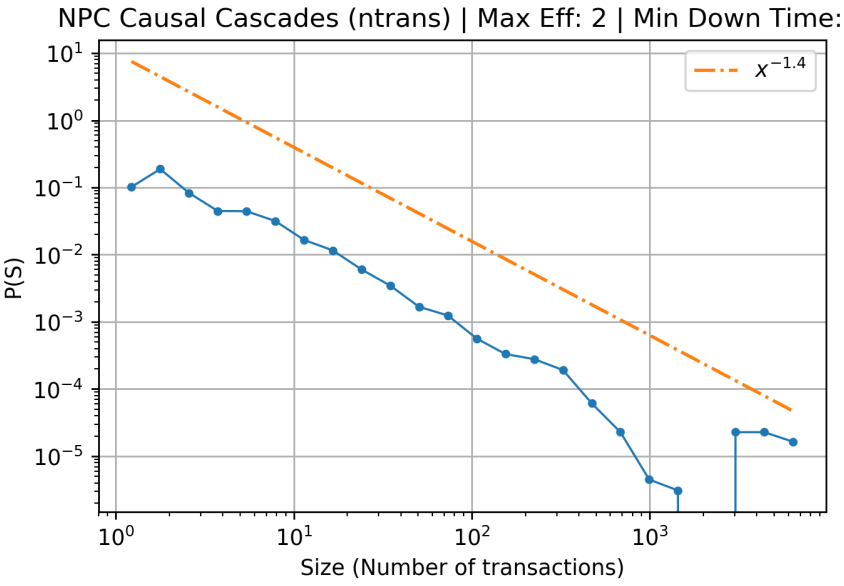

PC Causal Cascades (ntrans) | Max Eff: 1 | Min Down Time: 1
$x^{-1.3}$
P(S)
Size (Number of transactions)

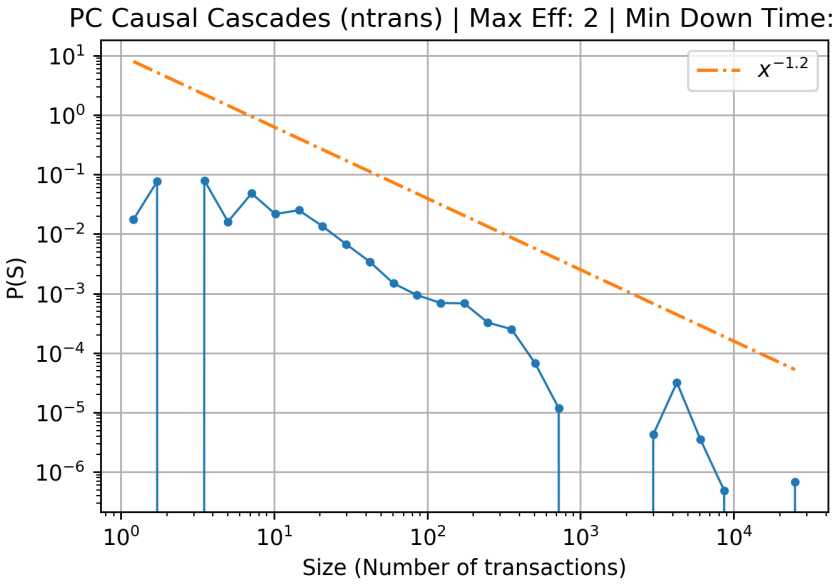

NPC Causal Cascades (ntrans) | Max Eff: 1 | Min Down Time: 1
$x^{-1.2}$
P(S)
Size (Number of transactions)

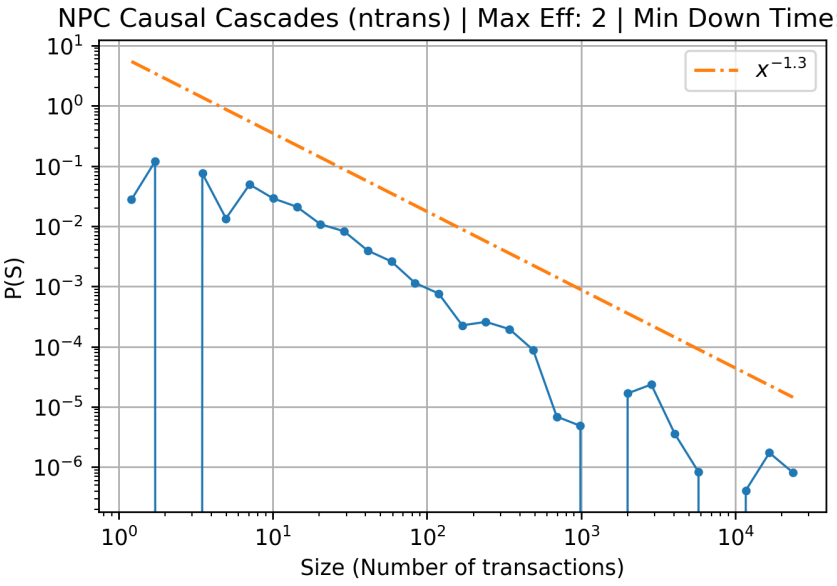

PC Causal Cascades (ntrans) | Max Eff: 1 | Min Down Time: 2
$x^{-1.3}$
P(S)
Size (Number of transactions)

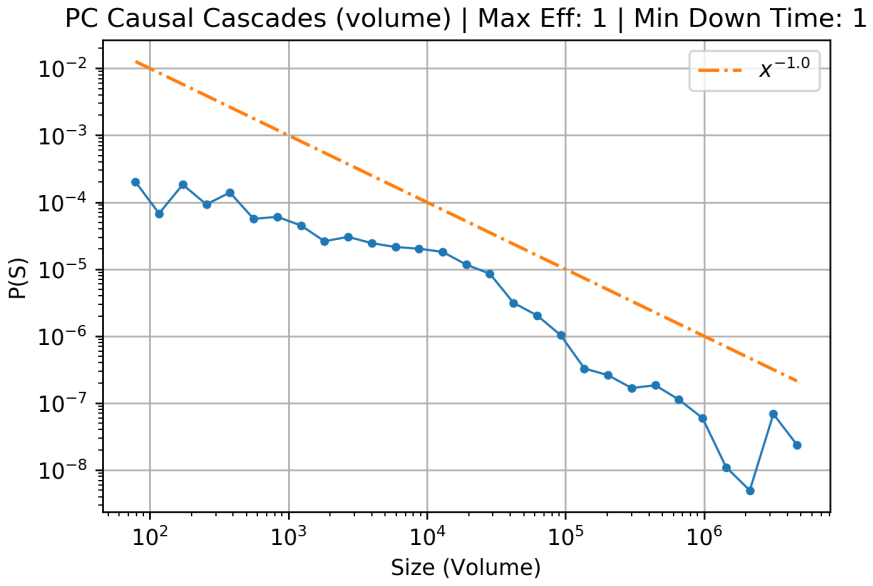

NPC Causal Cascades (ntrans) | Max Eff: 1 | Min Down Time: 2
$x^{-1.4}$
P(S)
Size (Number of transactions)

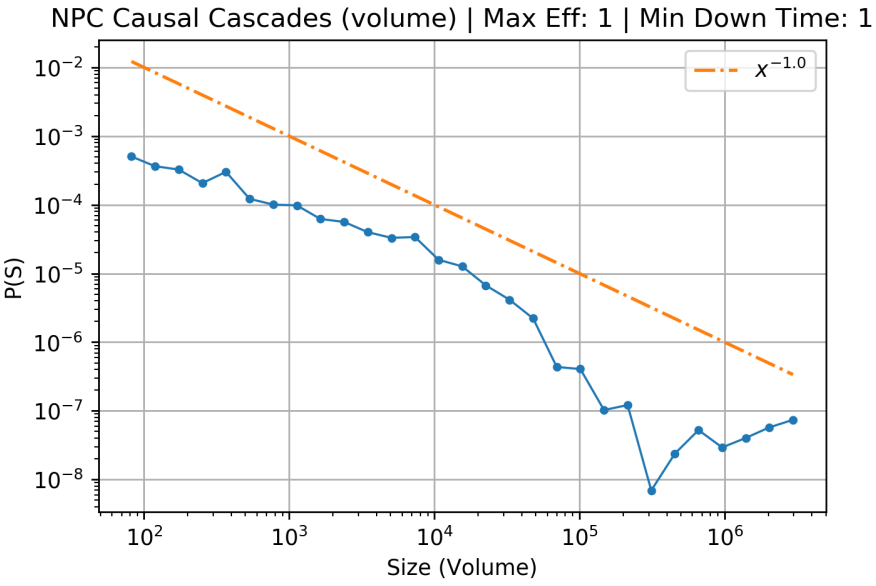

PC Causal Cascades (ntrans) | Max Eff: 2 | Min Down Time: 1
$x^{-1.25}$
P(S)
Size (Number of transactions)

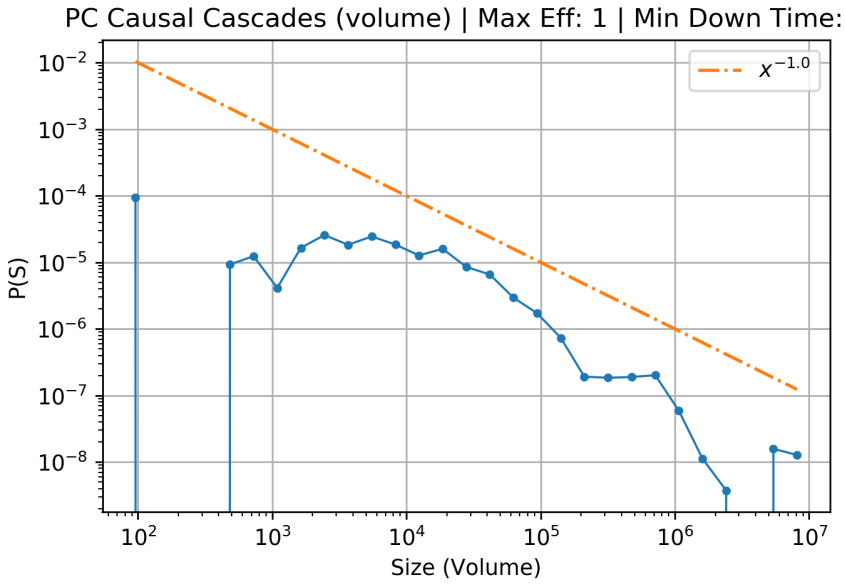

NPC Causal Cascades (ntrans) | Max Eff: 2 | Min Down Time: 1
$x^{-1.4}$
P(S)
Size (Number of transactions)

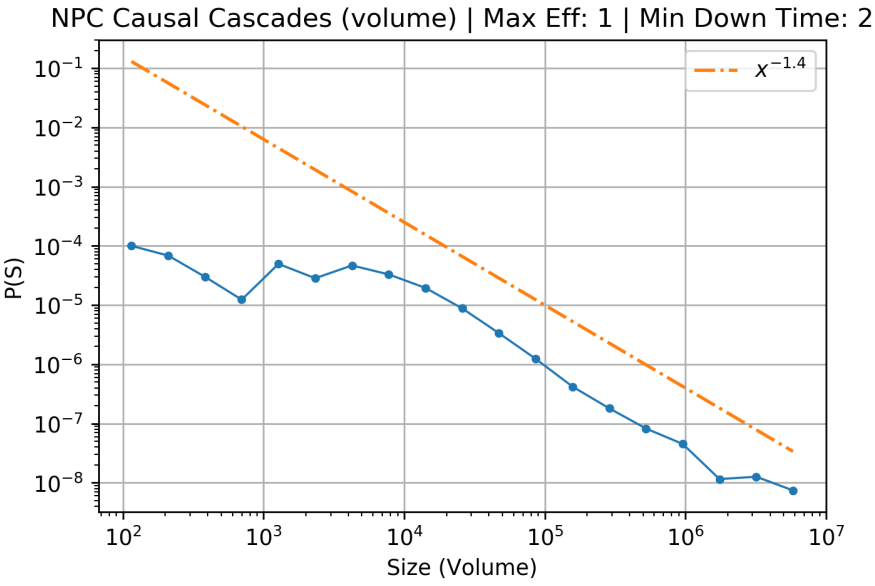

PC Causal Cascades (ntrans) | Max Eff: 2 | Min Down Time: 2
$x^{-1.2}$
P(S)
Size (Number of transactions)

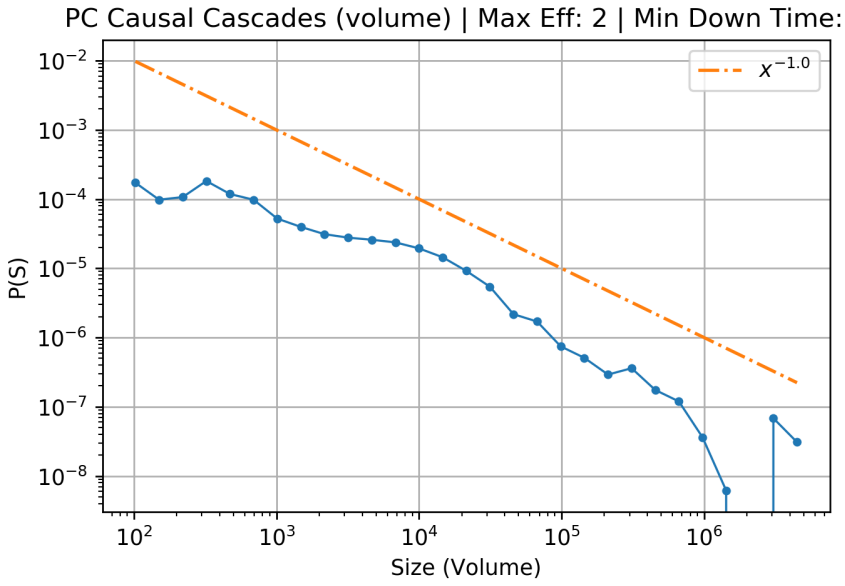

NPC Causal Cascades (ntrans) | Max Eff: 2 | Min Down Time: 2
$x^{-1.3}$
P(S)
Size (Number of transactions)

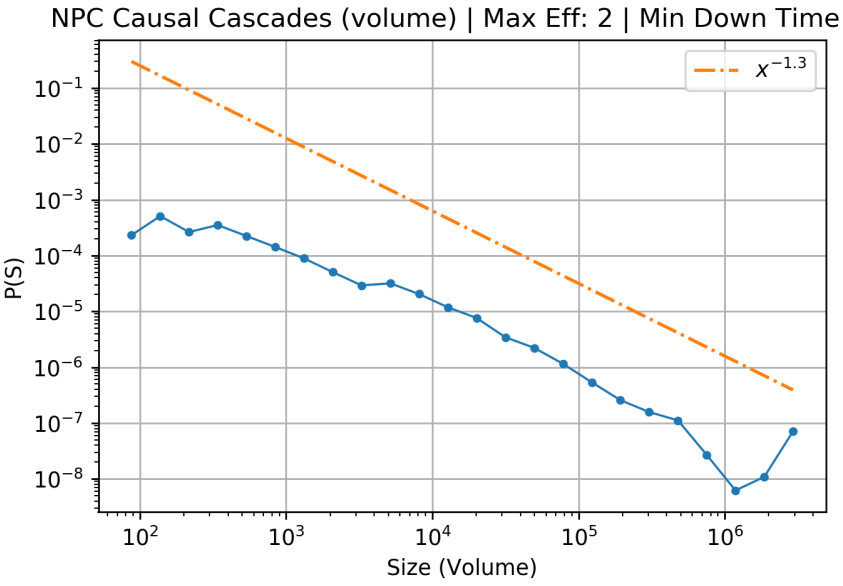

PC Causal Cascades (volume) | Max Eff: 1 | Min Down Time: 1
$x^{-1.0}$
P(S)
Size (Volume)
10^{-2}
10^{-3}
10^{-4}
10^{-5}
10^{-6}
10^{-7}
10^{-8}
10^{2}
10^{3}
10^{4}
10^{5}
10^{6}

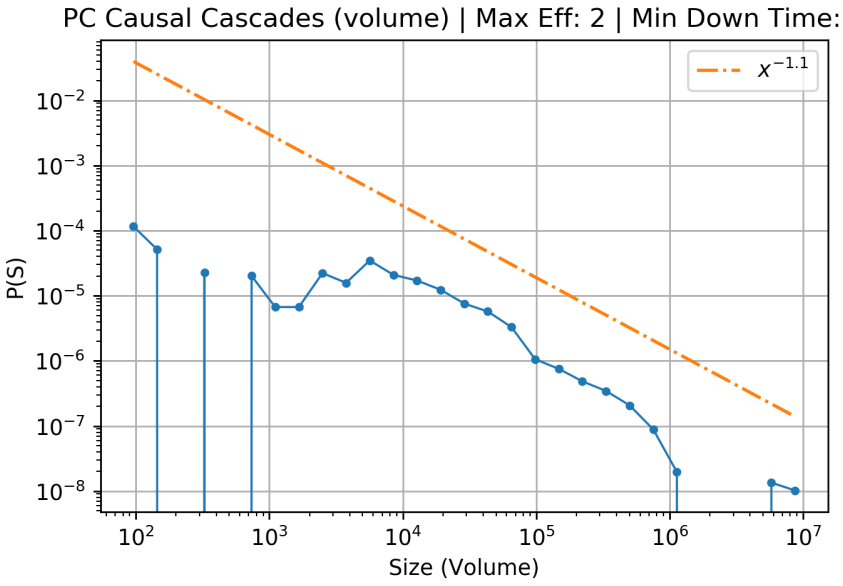

NPC Causal Cascades (volume) | Max Eff: 1 | Min Down Time: 1
$x^{-1.0}$
P(S)
Size (Volume)
10^{-2}
10^{-3}
10^{-4}
10^{-5}
10^{-6}
10^{-7}
10^{-8}
10^{2}
10^{3}
10^{4}
10^{5}
10^{6}

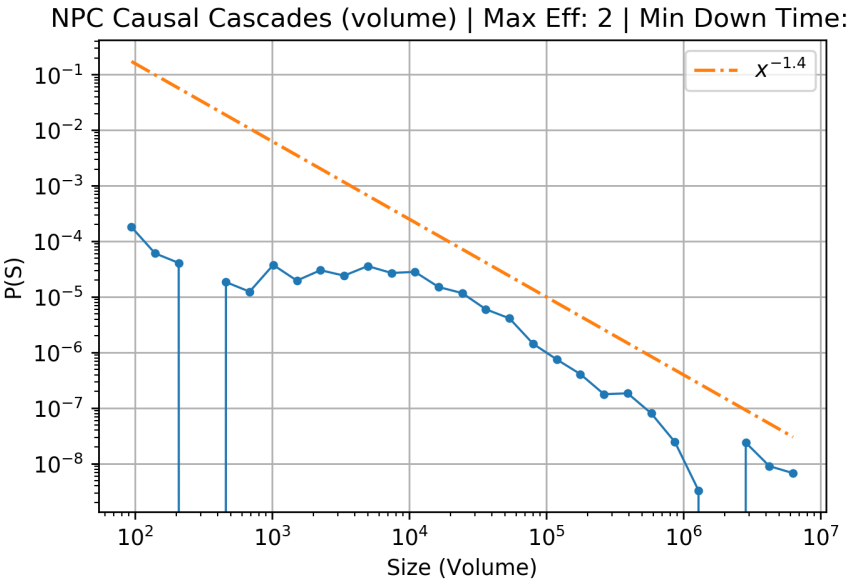

PC Causal Cascades (volume) | Max Eff: 1 | Min Down Time: 2
$x^{-1.0}$
P(S)
Size (Volume)


NPC Causal Cascades (volume) | Max Eff: 1 | Min Down Time: 2
$x^{-1.4}$
P(S)
Size (Volume)

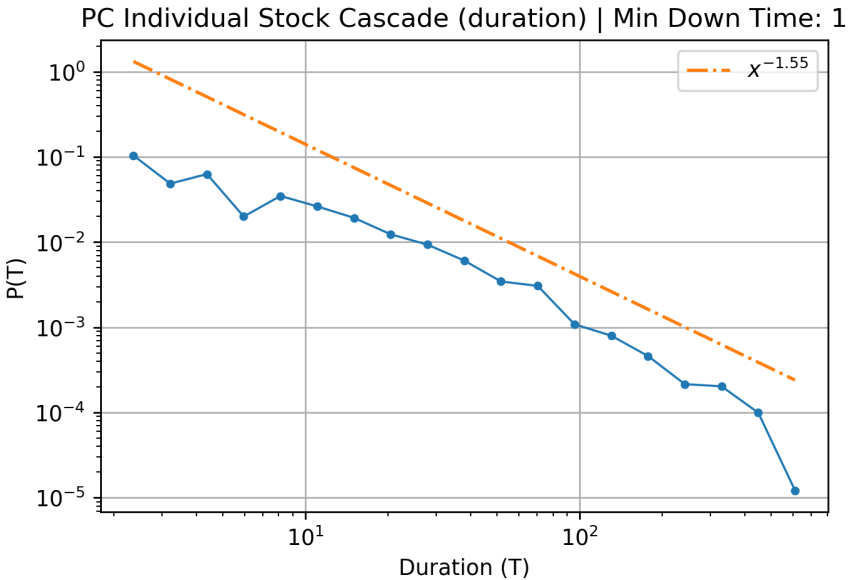

PC Causal Cascades (volume) | Max Eff: 2 | Min Down Time: 1
$x^{-1.0}$
P(S)
Size (Volume)

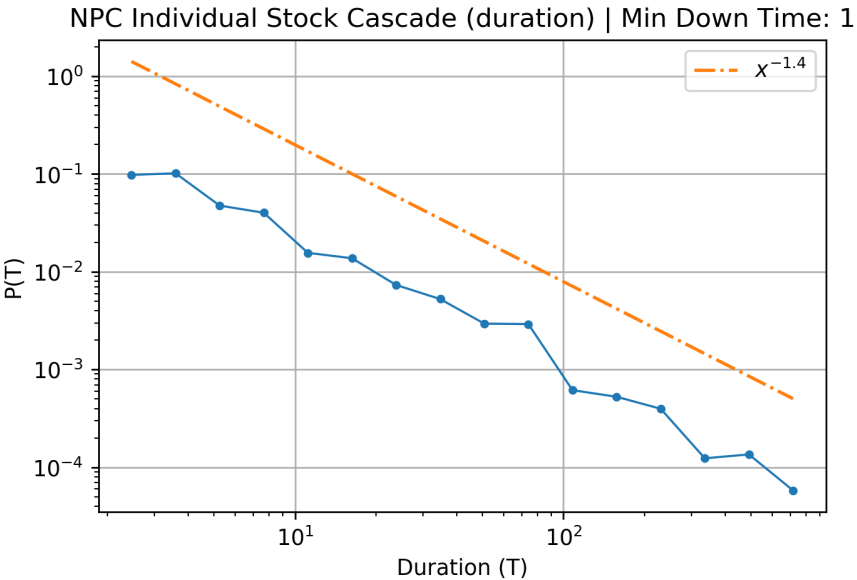

NPC Causal Cascades (volume) | Max Eff: 2 | Min Down Time: 1
$x^{-1.3}$
P(S)
Size (Volume)

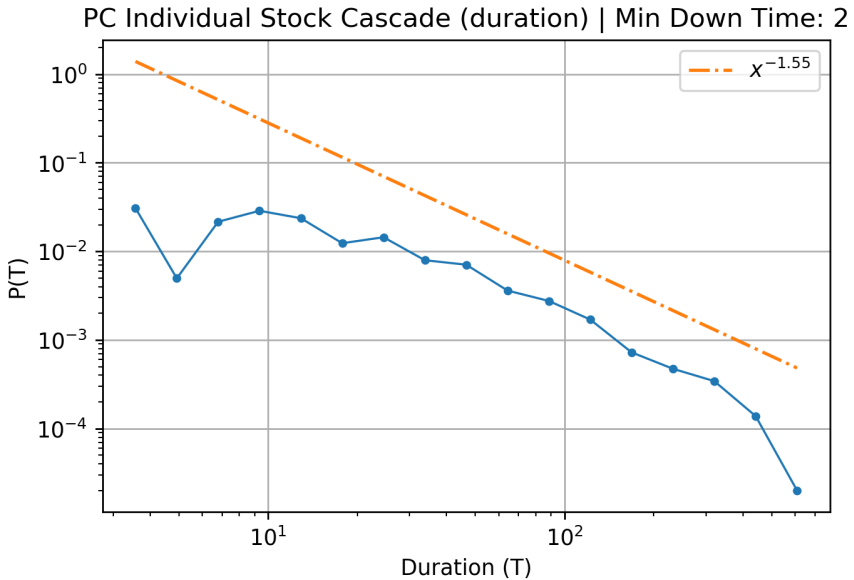

PC Causal Cascades (volume) | Max Eff: 2 | Min Down Time: 2
$x^{-1.1}$
P(S)
Size (Volume)

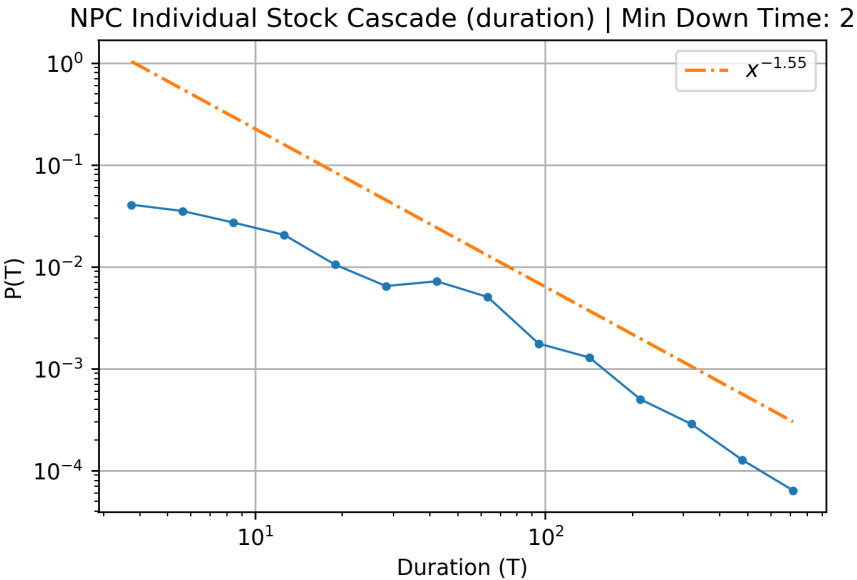

NPC Causal Cascades (volume) | Max Eff: 2 | Min Down Time: 2
$x^{-1.4}$
P(S)
Size (Volume)

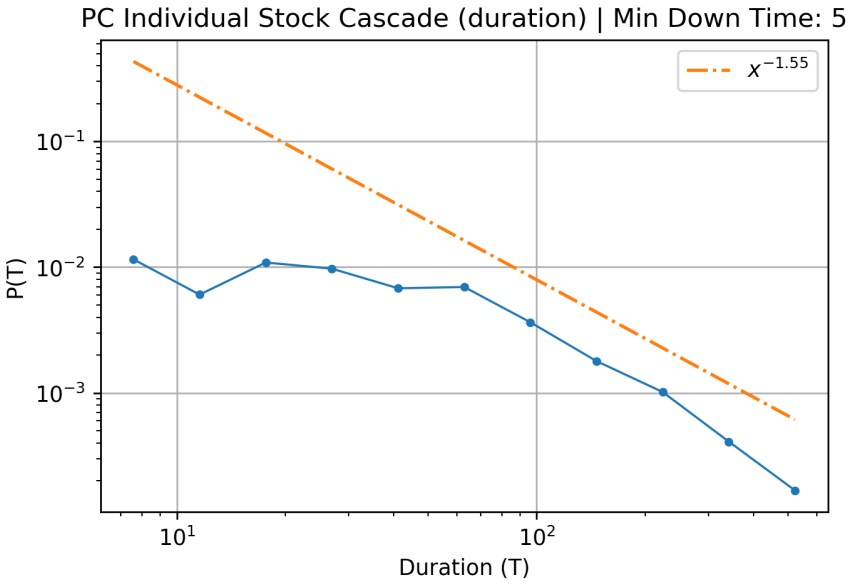
Stock Cascades

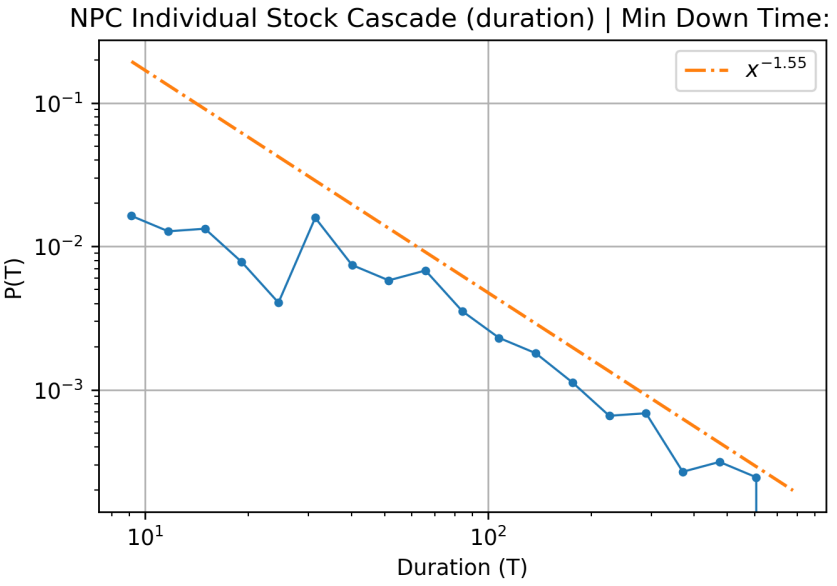


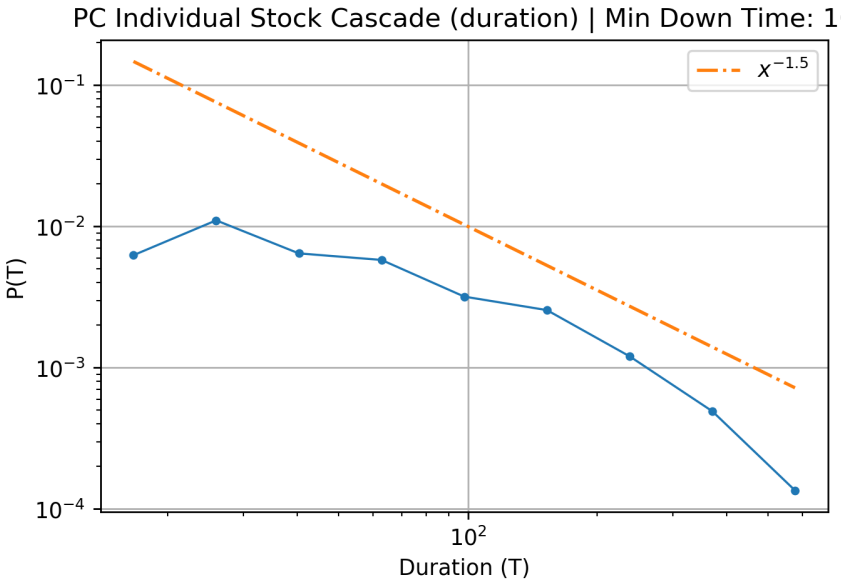


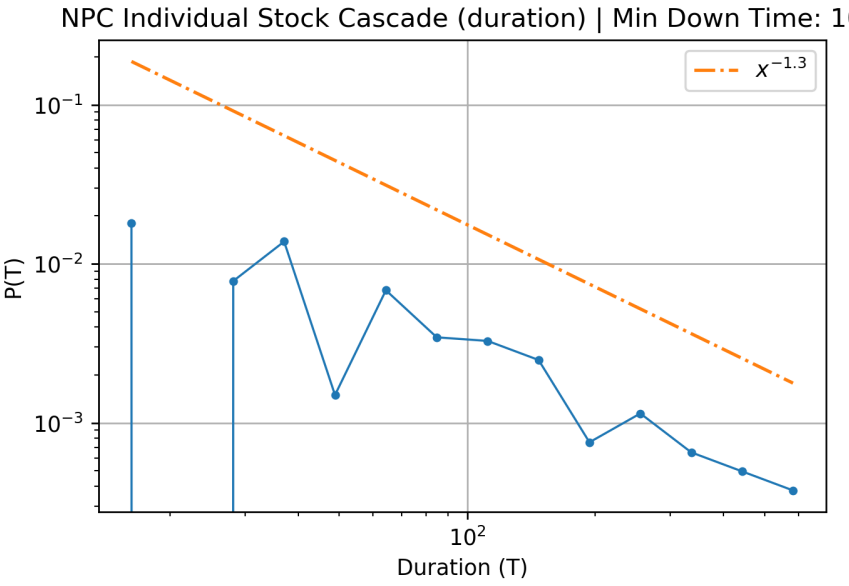

PC Individual Stock Cascade (duration) | Min Down Time: 2
$x^{-1.55}$
P(T)
Duration (T)
10^0
10^{-1}
10^{-2}
10^{-3}
10^{-4}
10^1
10^2

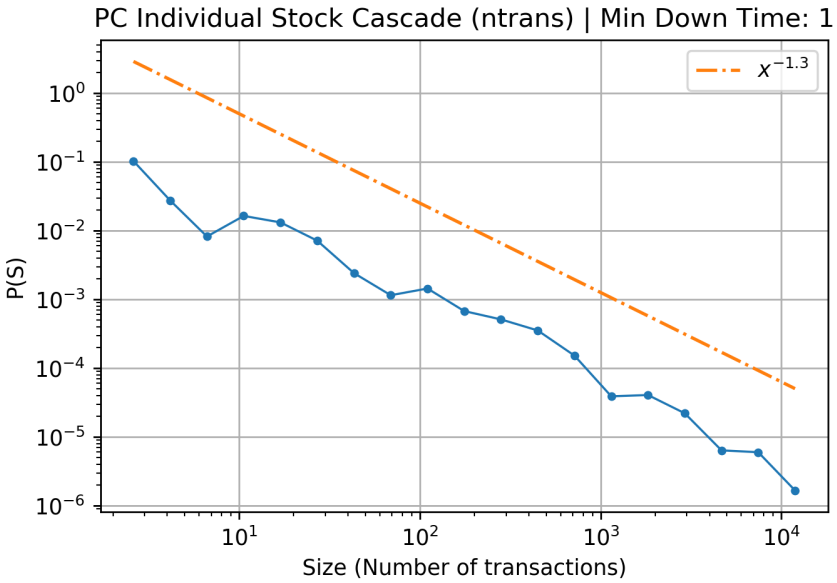

NPC Individual Stock Cascade (duration) | Min Down Time: 2
$x^{-1.55}$
P(T)
Duration (T)
10^0
10^{-1}
10^{-2}
10^{-3}
10^{-4}
10^1
10^2

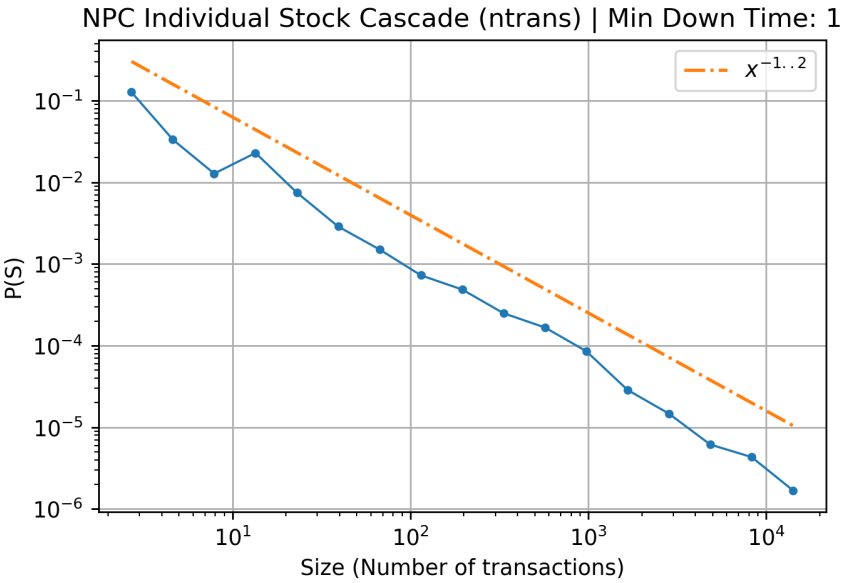

PC Individual Stock Cascade (duration) | Min Down Time: 5
$x^{-1.55}$
10^{-1}
10^{-2}
10^{-3}
P(T)
10^{1}
10^{2}
Duration (T)

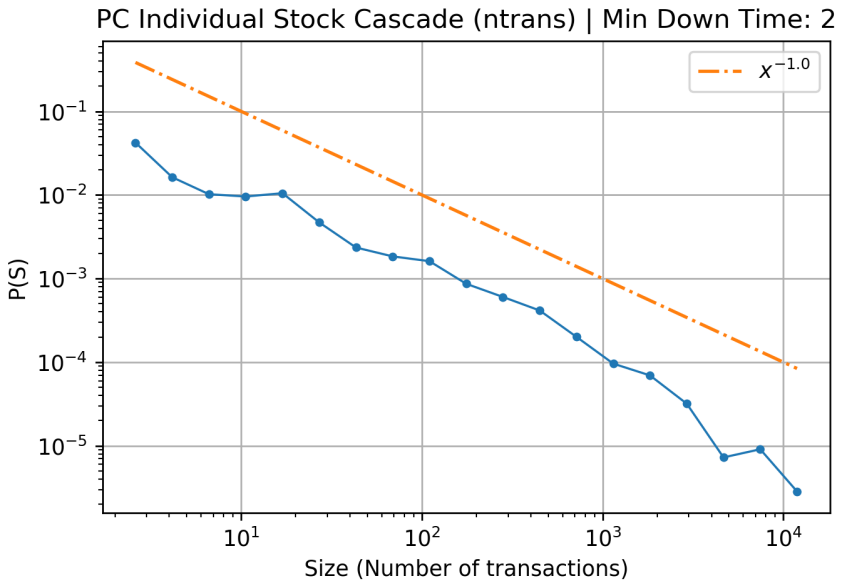

NPC Individual Stock Cascade (duration) | Min Down Time: 5
$x^{-1.55}$
10^{-1}
10^{-2}
10^{-3}
P(T)
10^{1}
10^{2}
Duration (T)

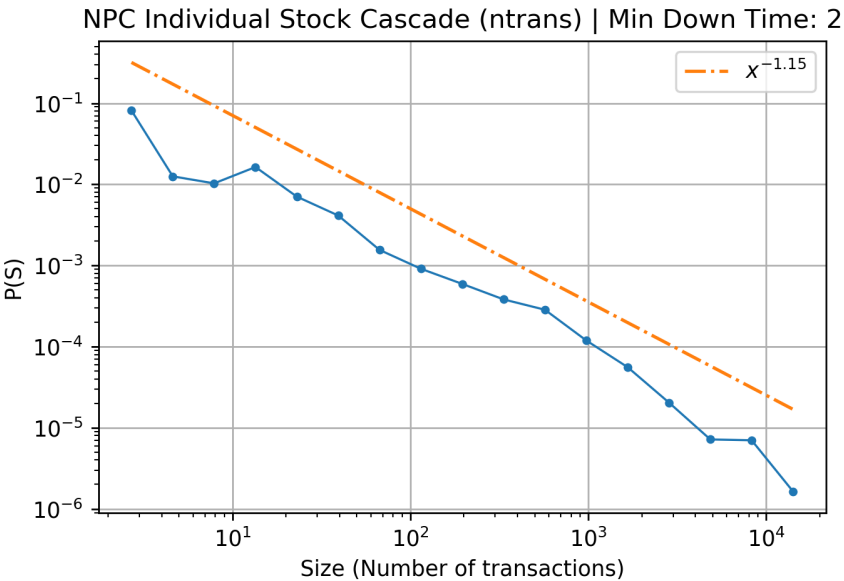

PC Individual Stock Cascade (duration) | Min Down Time: 10
$x^{-1.5}$
10^{-1}
10^{-2}
10^{-3}
10^{-4}
P(T)
10^{2}
Duration (T)

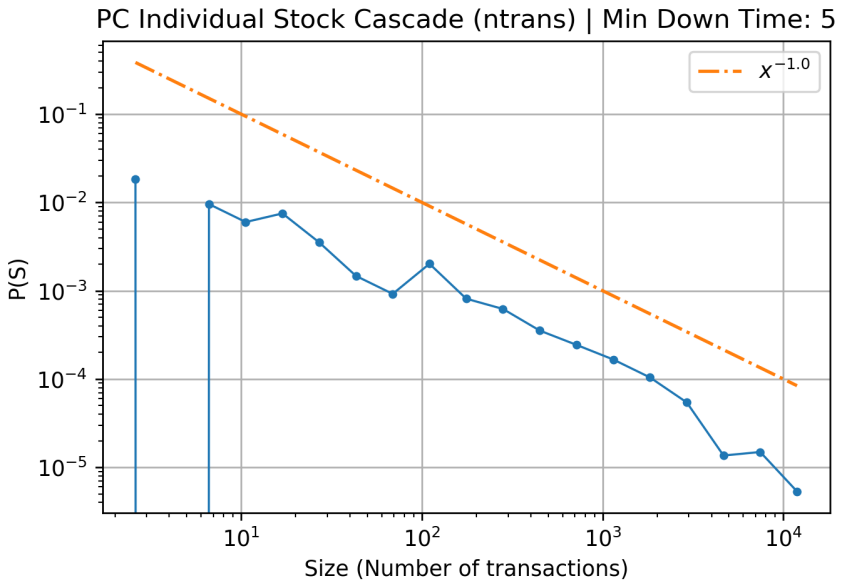

NPC Individual Stock Cascade (duration) | Min Down Time: 10
$x^{-1.3}$
10^{-1}
10^{-2}
10^{-3}
P(T)
10^{2}
Duration (T)

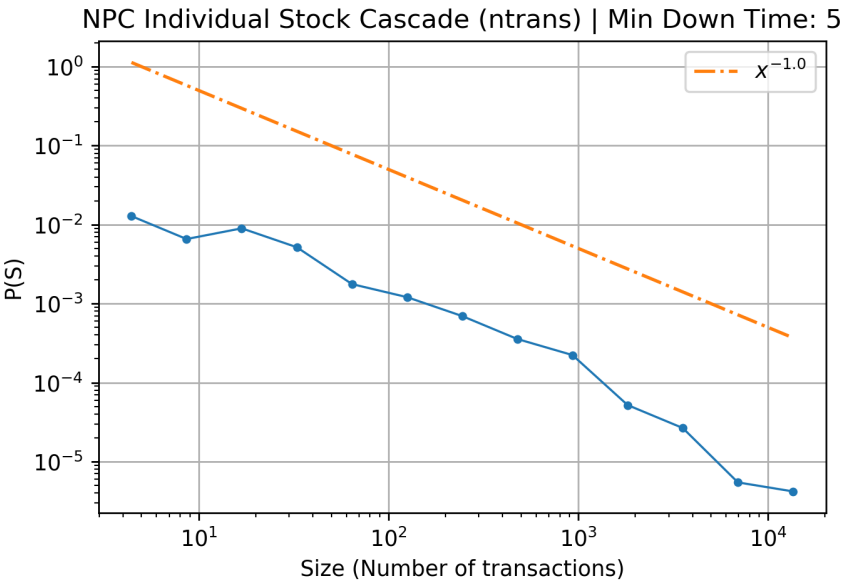

PC Individual Stock Cascade (ntrans) | Min Down Time: 1
$x^{-1.3}$
P(S)
Size (Number of transactions)

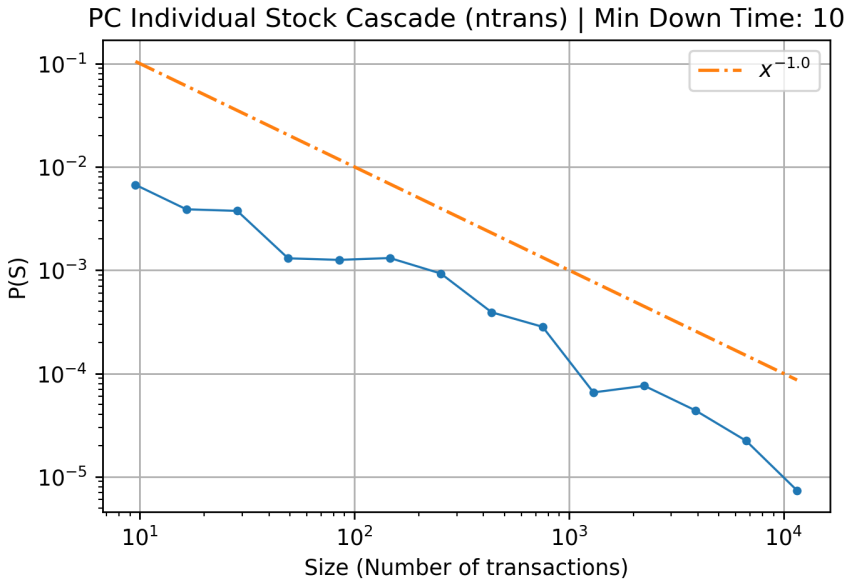

NPC Individual Stock Cascade (ntrans) | Min Down Time: 1
$x^{-1..2}$
P(S)
Size (Number of transactions)

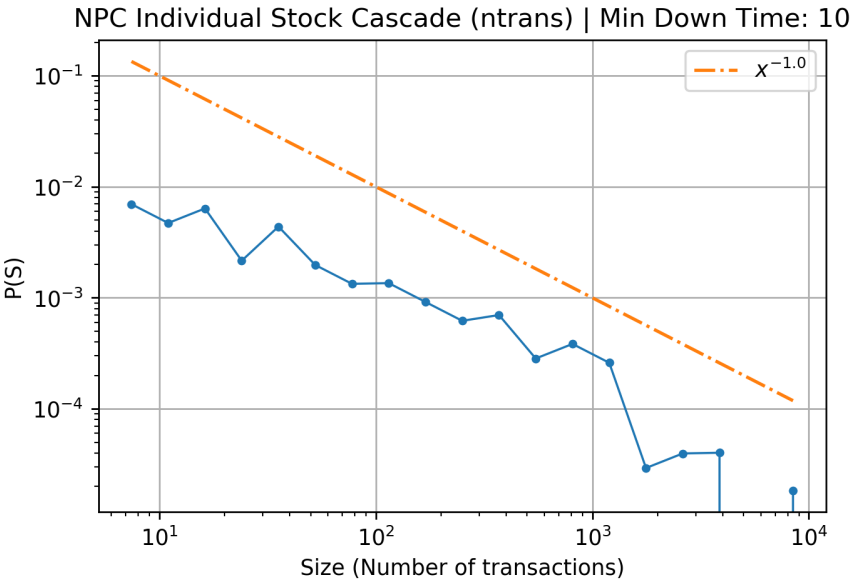

PC Individual Stock Cascade (ntrans) | Min Down Time: 2
$x^{-1.0}$
P(S)
Size (Number of transactions)

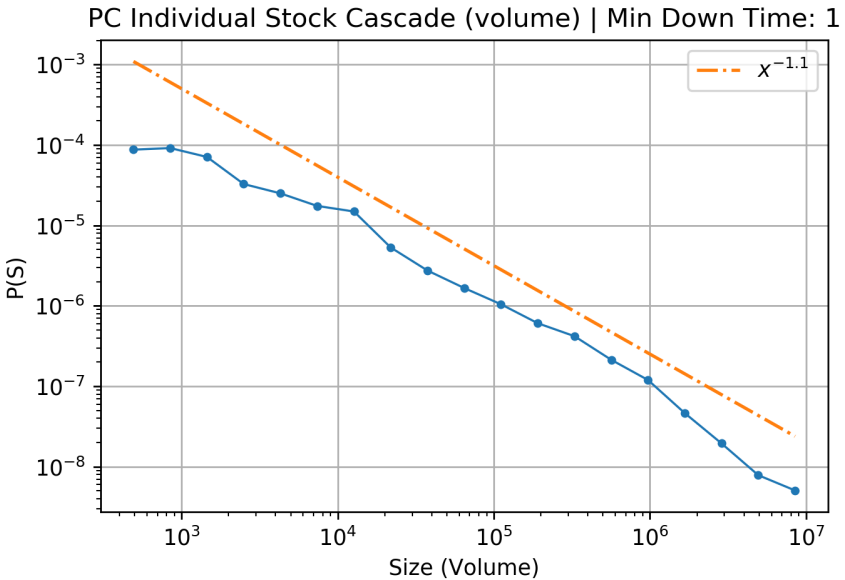

NPC Individual Stock Cascade (ntrans) | Min Down Time: 2
$x^{-1.15}$
P(S)
Size (Number of transactions)

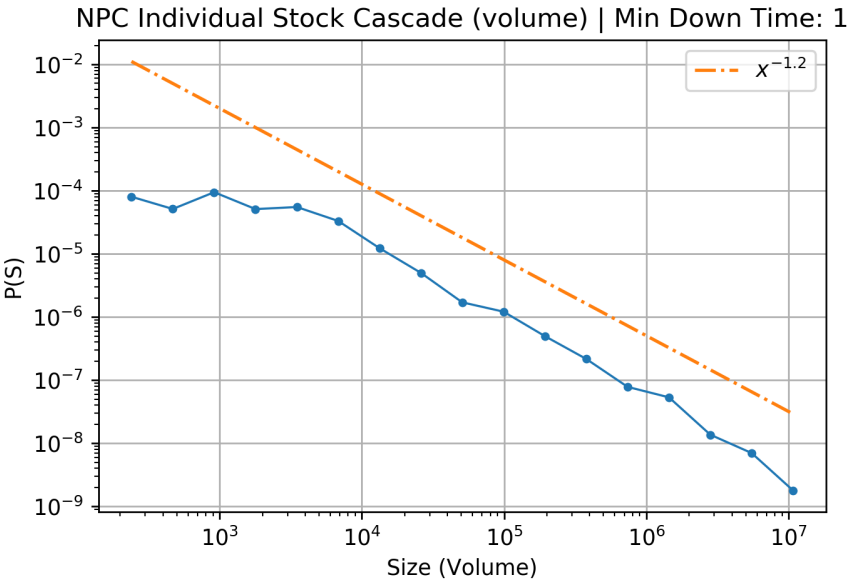

PC Individual Stock Cascade (ntrans) | Min Down Time: 5
$x^{-1.0}$
P(S)
Size (Number of transactions)

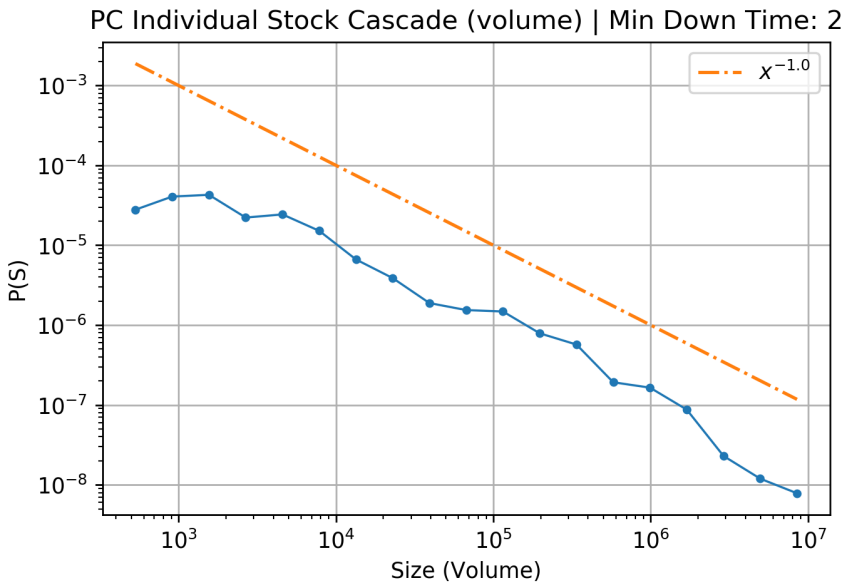

NPC Individual Stock Cascade (ntrans) | Min Down Time: 5
$x^{-1.0}$
P(S)
Size (Number of transactions)

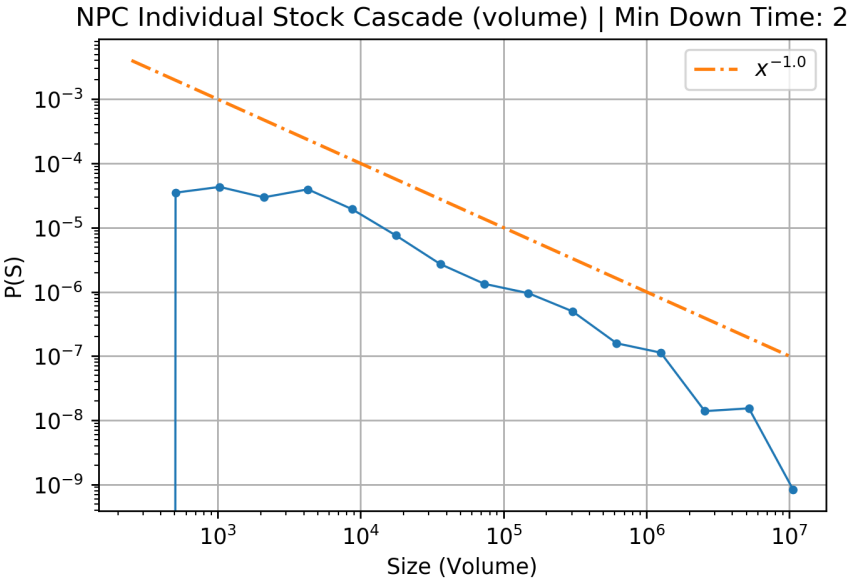

PC Individual Stock Cascade (ntrans) | Min Down Time: 10
$x^{-1.0}$
P(S)
Size (Number of transactions)

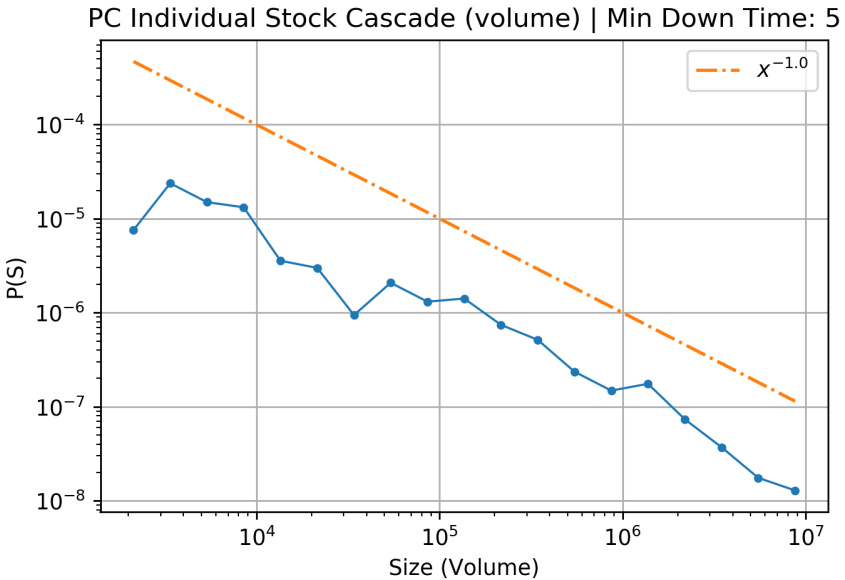

NPC Individual Stock Cascade (ntrans) | Min Down Time: 10
$x^{-1.0}$
P(S)
Size (Number of transactions)

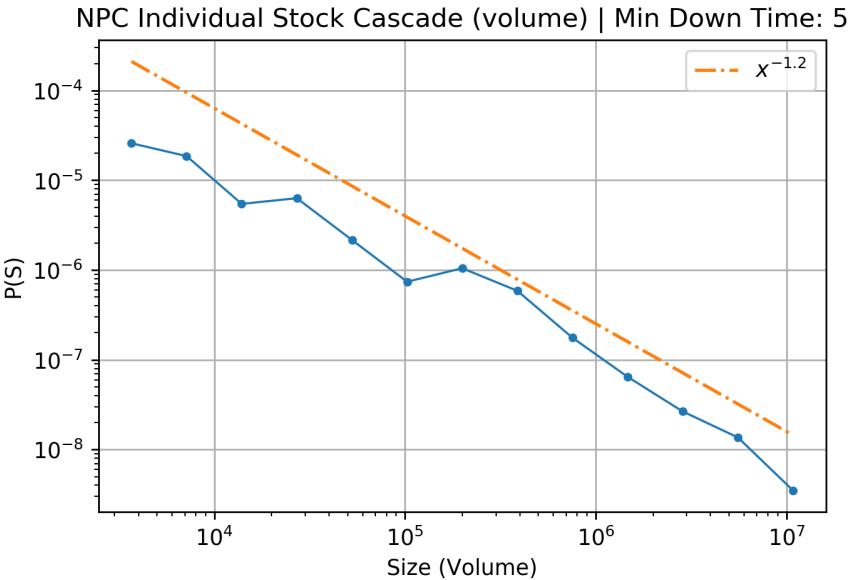

PC Individual Stock Cascade (volume) | Min Down Time: 1
$x^{-1.1}$
P(S)
Size (Volume)

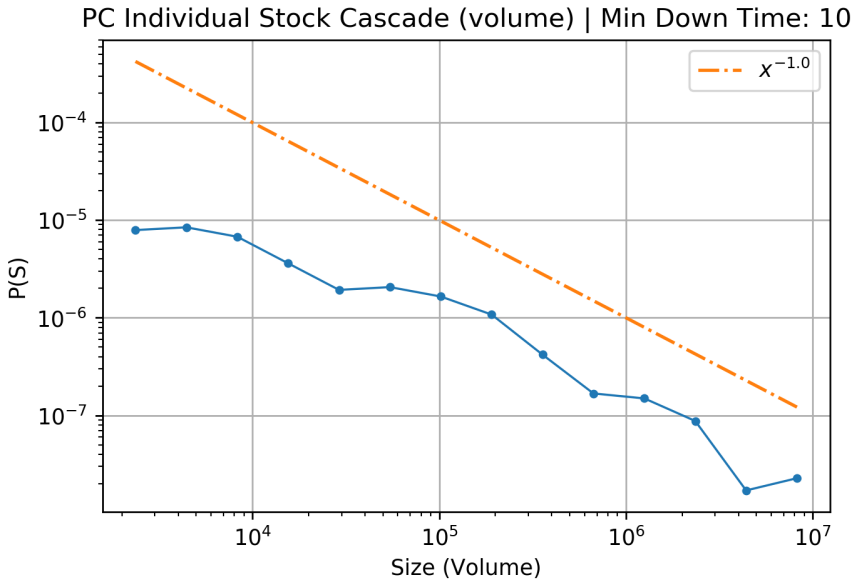

NPC Individual Stock Cascade (volume) | Min Down Time: 1
$x^{-1.2}$
P(S)
Size (Volume)

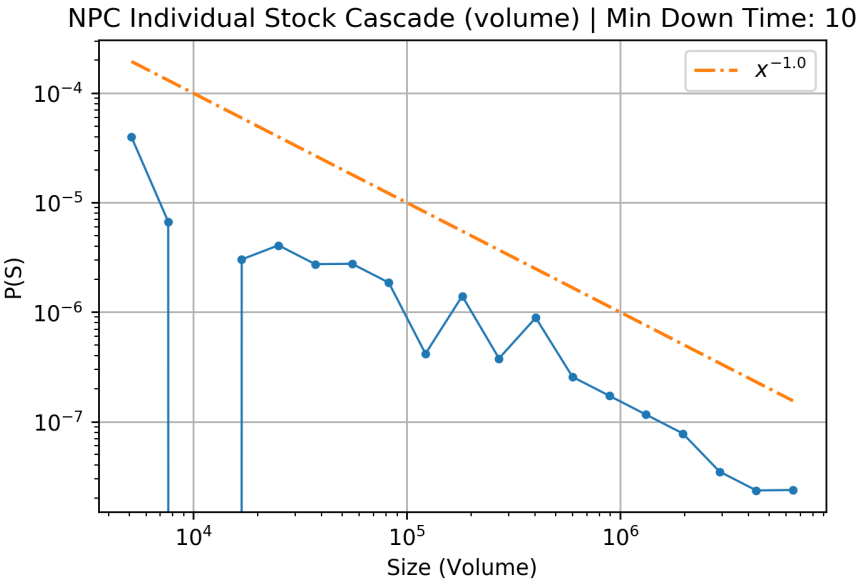

PC Individual Stock Cascade (volume) | Min Down Time: 2
$x^{-1.0}$
P(S)
Size (Volume)


NPC Individual Stock Cascade (volume) | Min Down Time: 2
$x^{-1.0}$
P(S)
Size (Volume)


PC Individual Stock Cascade (volume) | Min Down Time: 5
$x^{-1.0}$
P(S)
Size (Volume)


NPC Individual Stock Cascade (volume) | Min Down Time: 5
$x^{-1.2}$
P(S)
Size (Volume)


PC Individual Stock Cascade (volume) | Min Down Time: 10
$x^{-1.0}$
P(S)
10^{-4}
10^{-5}
10^{-6}
10^{-7}
10^{4}
10^{5}
10^{6}
10^{7}
Size (Volume)


NPC Individual Stock Cascade (volume) | Min Down Time: 10
$x^{-1.0}$
P(S)
10^{-4}
10^{-5}
10^{-6}
10^{-7}
10^{4}
10^{5}
10^{6}
Size (Volume)