

Dynamical Graph Grammar for the Cortical Microtubule Array (CMA)

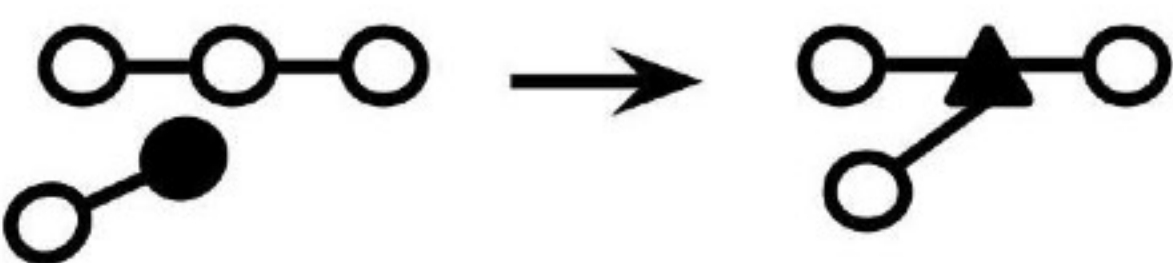
R1: Elongation by polymerization ODE



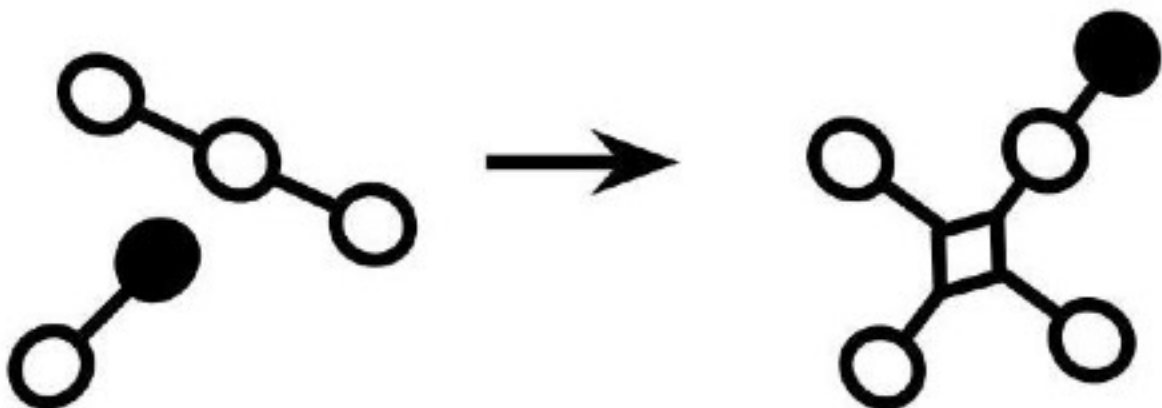
R2: MT elongation event



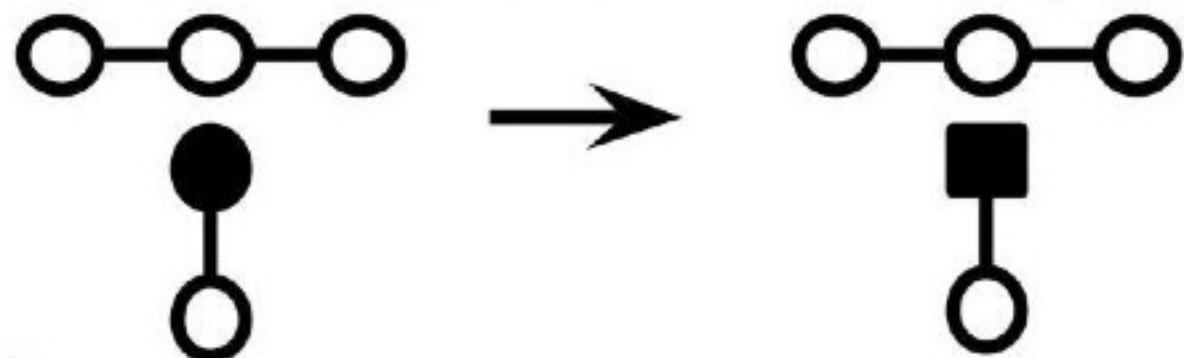
R3: MT zippering event



R4: MT crossover event



R5: MT collision catastrophe



R6: Retraction by depolymerization ODE



R7: MT retraction event



R8: State change, destabilization/rescue events



● : polymerizing (growing) end

○ : intermediate tubulin segment

■ : depolymerizing (retracting) end

▲ : zippering location

◊ : crossover location (junction)

Experiment 1

1600 Microtubules, Crossover and No Zippering

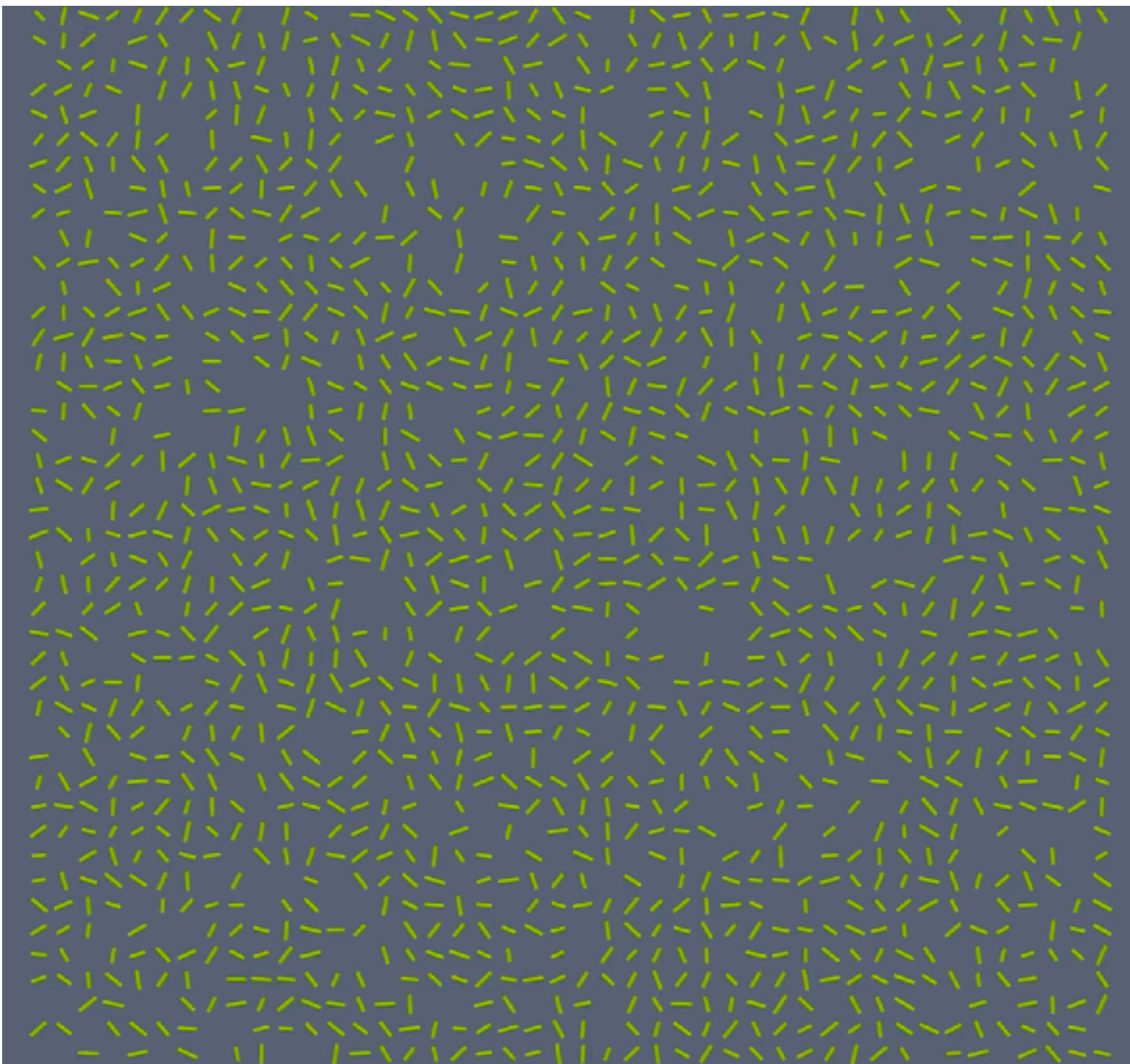


Figure 31: Long-time behavior of simulation with crossover, but low zippering.

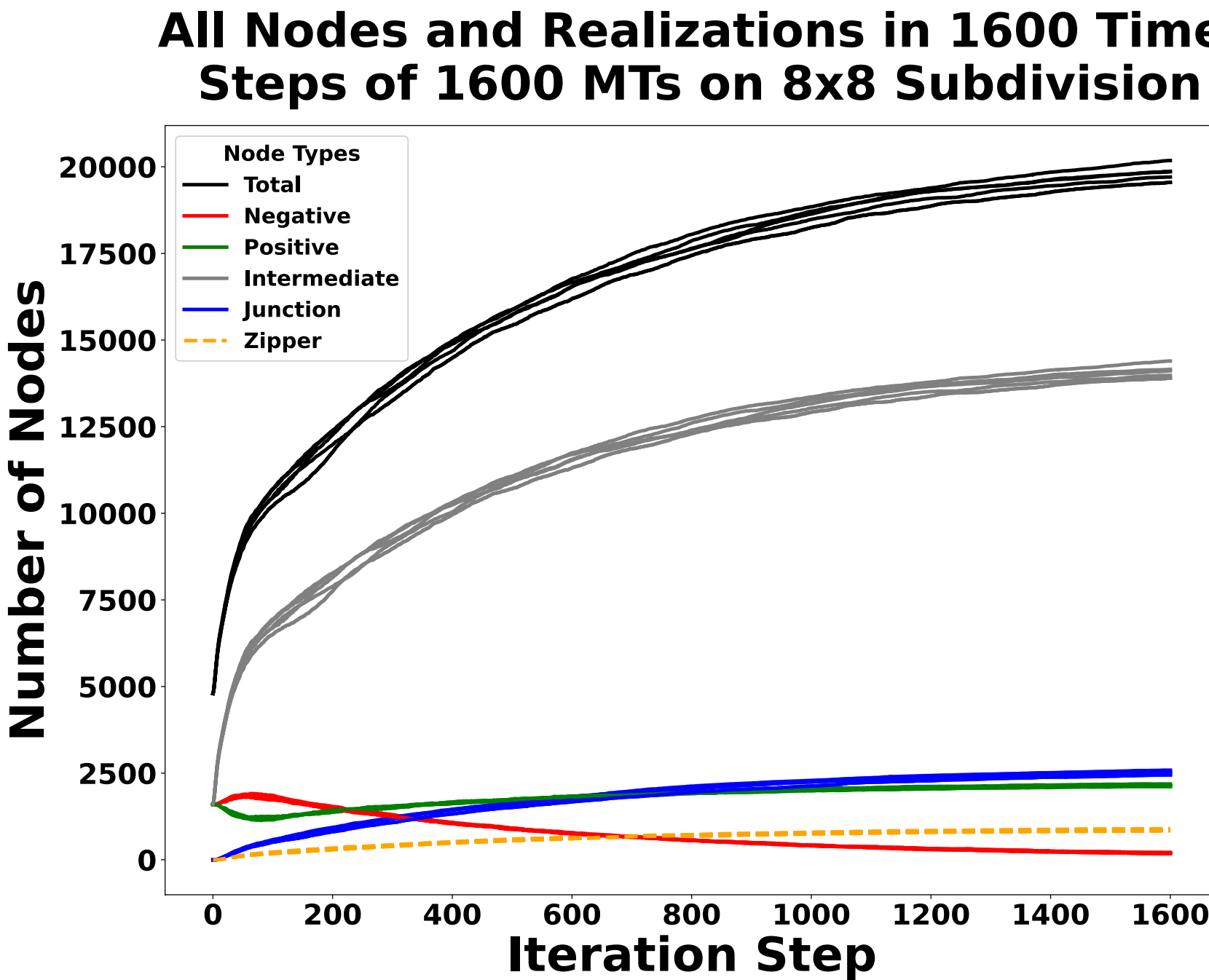


Figure 32: Long-behavior on the node types found within the system.

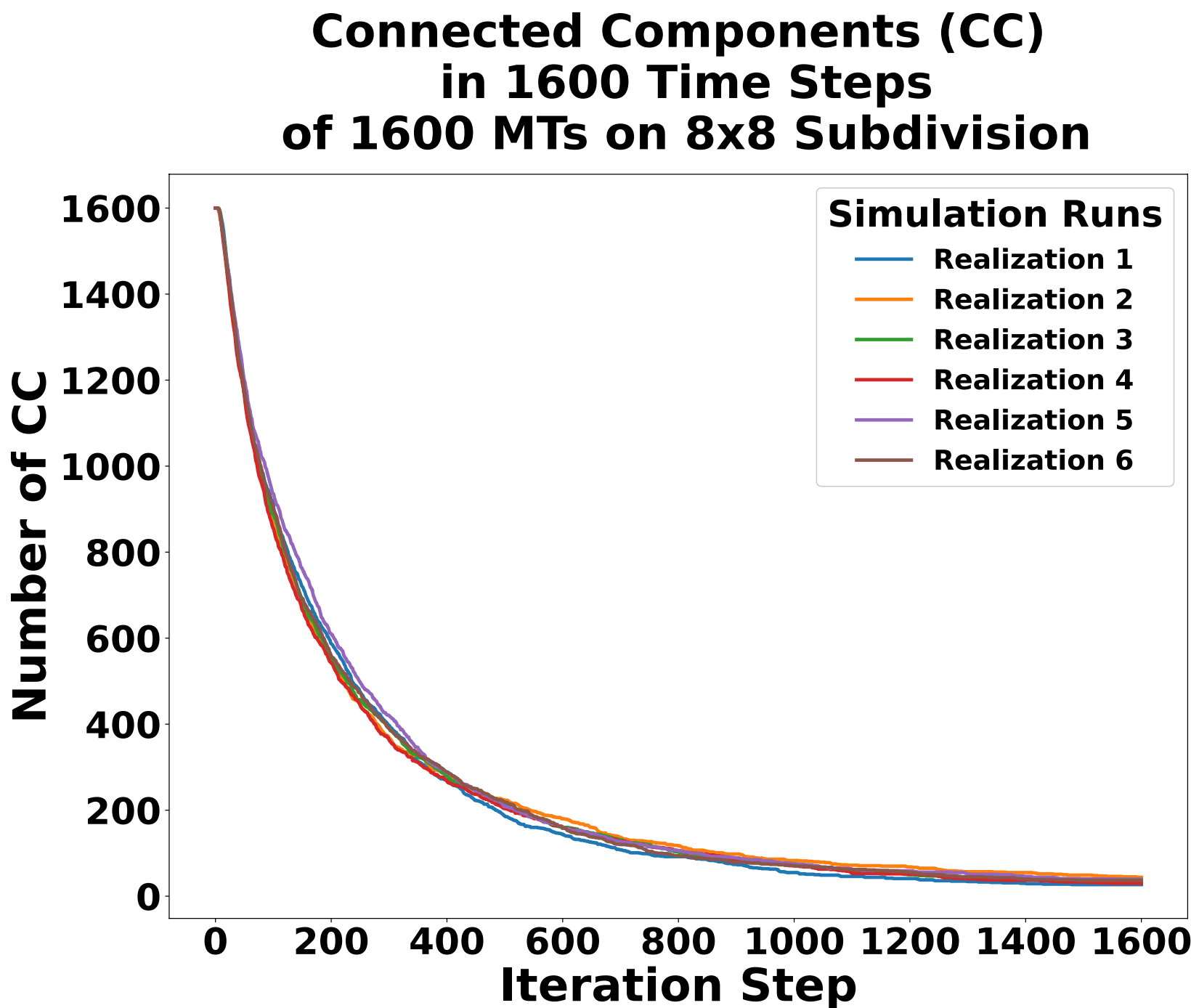


Figure 33: Long-time behavior of the number of connected components in the system, with an end state of a highly connected network.