

Each of the test grids were run, producing the following results:

1. testgrid\_1
  - Affect rate: 0.1
  - Epsilon: 0.1
  - Converged in 51 iterations
  - Minimum DSV: 107.278672
  - Maximum DSV: 118.918450
  - Convergence loop time [time()]: 0 s
  - Convergence loop time[clock()]: 0.000000 s
  - Convergence loop time[clock\_gettime()]: 0.010791 ms
  - /usr/bin/time real: 0.00
  - /usr/bin/time user: 0.00
  - /usr/bin/time sys: 0.00
2. testgrid\_2
  - Affect rate: 0.1
  - Epsilon: 0.1
  - Converged in 244 iterations
  - Minimum DSV: 50.266851
  - Maximum DSV: 55.835885
  - Convergence loop time [time()]: 0 s
  - Convergence loop time[clock()]: 0.000000 s
  - Convergence loop time[clock\_gettime()]: 0.306597 ms
  - /usr/bin/time real: 0.00
  - /usr/bin/time user: 0.00
  - /usr/bin/time sys: 0.00
3. testgrid\_50\_78
  - Affect rate: 0.1
  - Epsilon: 0.1
  - Converged in 1507 iterations
  - Minimum DSV: 21.035843
  - Maximum DSV: 23.369508
  - Convergence loop time [time()]: 0 s
  - Convergence loop time[clock()]: 0.000000 s
  - Convergence loop time[clock\_gettime()]: 3.559779 ms
  - /usr/bin/time real: 0.00
  - /usr/bin/time user: 0.00
  - /usr/bin/time sys: 0.00
4. testgrid\_50\_201
  - Affect rate: 0.1
  - Epsilon: 0.1
  - Converged in 2285 iterations
  - Minimum DSV: 4.309887
  - Maximum DSV: 4.788754
  - Convergence loop time [time()]: 0 s
  - Convergence loop time[clock()]: 0.010000 s
  - Convergence loop time[clock\_gettime()]: 14.535442ms
  - /usr/bin/time real: 0.01
  - /usr/bin/time user: 0.01

- /usr/bin/time sys: 0.00
- 5. testgrid\_200\_1166
  - Affect rate: 0.1
  - Epsilon: 0.1
  - Converged in 14457 iterations
  - Minimum DSV: 0.731459
  - Maximum DSV: 0.812728
  - Convergence loop time [time()]: 1 s
  - Convergence loop time[clock()]: 0.720000 s
  - Convergence loop time[clock\_gettime()]: 723.946198 ms
  - /usr/bin/time real: 0.72
  - /usr/bin/time user: 0.72
  - /usr/bin/time sys: 0.00
- 6. testgrid\_400\_1636
  - Affect rate: 0.1
  - Epsilon: 0.1
  - Converged in 22279 iterations
  - Minimum DSV: 1.063610
  - Maximum DSV: 1.181786
  - Convergence loop time [time()]: 1 s
  - Convergence loop time[clock()]: 1.680000 s
  - Convergence loop time[clock\_gettime()]: 1698.727564 ms
  - /usr/bin/time real: 1.70
  - /usr/bin/time user: 1.68
  - /usr/bin/time sys: 0.00
- 7. testgrid\_400\_12206
  - Affect rate: 0.1
  - Epsilon: 0.1
  - Converged in 75196 iterations
  - Minimum DSV: 0.078004
  - Maximum DSV: 0.086671
  - Convergence loop time [time()]: 48 s
  - Convergence loop time[clock()]: 47.740000 s
  - Convergence loop time[clock\_gettime()]: 48043.562866 ms
  - /usr/bin/time real: 48.07
  - /usr/bin/time user: 47.72
  - /usr/bin/time sys: 0.05

Additionally, with the following parameters, testgrid\_400\_12206 ran between 3 to 6 minutes:

- 8. testgrid\_400\_12206 (long)
  - Affect rate: 0.03
  - Epsilon: 0.03
  - Converged in 434141 iterations
  - Minimum DSV: 0.082397
  - Maximum DSV: 0.084946
  - Convergence loop time [time()]: 277 s
  - Convergence loop time[clock()]: 275.890000 s
  - Convergence loop time[clock\_gettime()]: 277424.065917 ms
  - /usr/bin/time real: 277.45
  - /usr/bin/time user: 275.80

- `/usr/bin/time sys: 0.11`

In summary, as the number of boxes increased, or as the affect rate or epsilon value decreased, the running time of the program increased. Since the convergence loop times are all very close to their `/usr/bin/time` counterparts, we see that the majority of the time in the program is spent running the convergence loop.