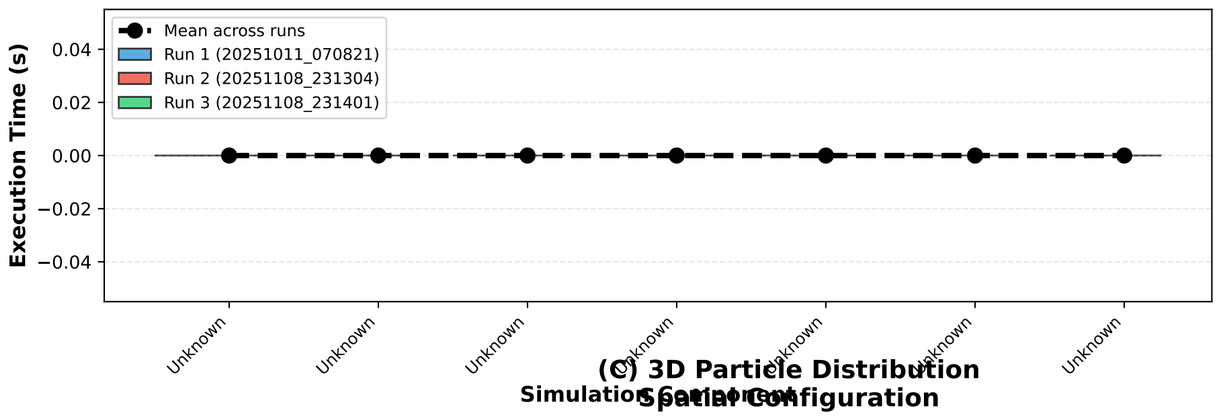
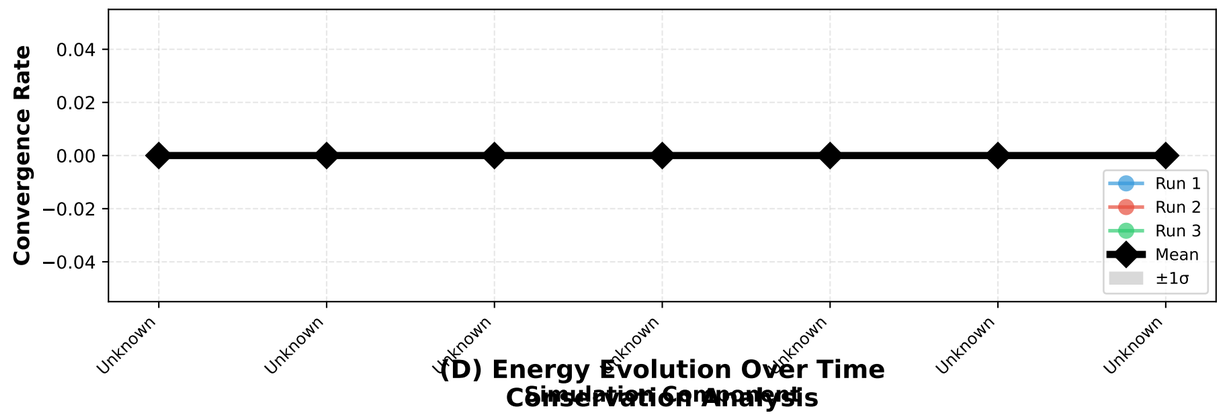
Simulation Test Multi-Run Analysis: Particle Dynamics and Reproducibility
3 Runs | 7 Components | 1,000 Particles | 100 Timesteps

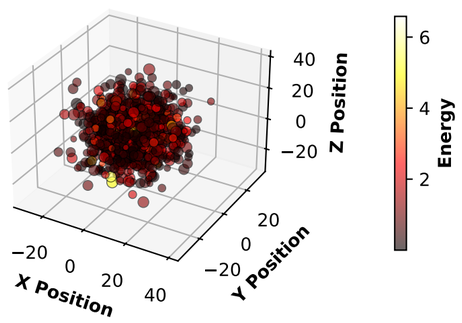
(A) Simulation Execution Time Comparison
Multi-Run Performance



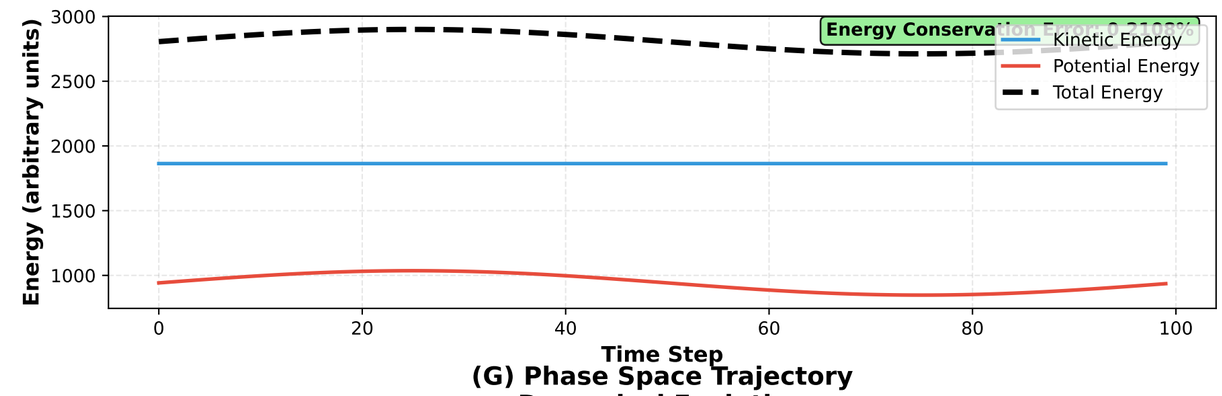
(B) Convergence Analysis Across Runs
Numerical Stability



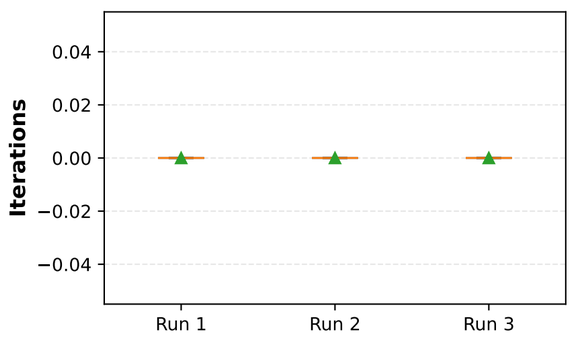
(C) 3D Particle Distribution
Spatial Configuration



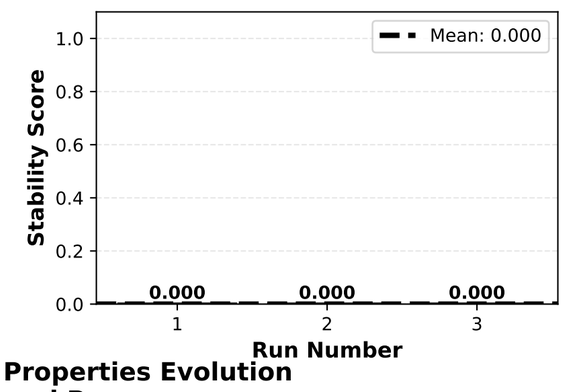
(D) Energy Evolution Over Time
Conservation Analysis



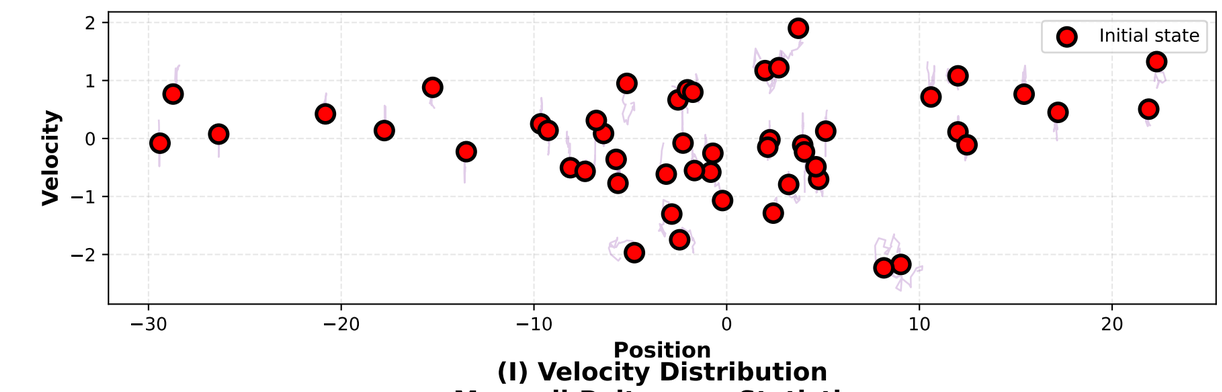
(E) Iteration Count Distribution
Computational Effort



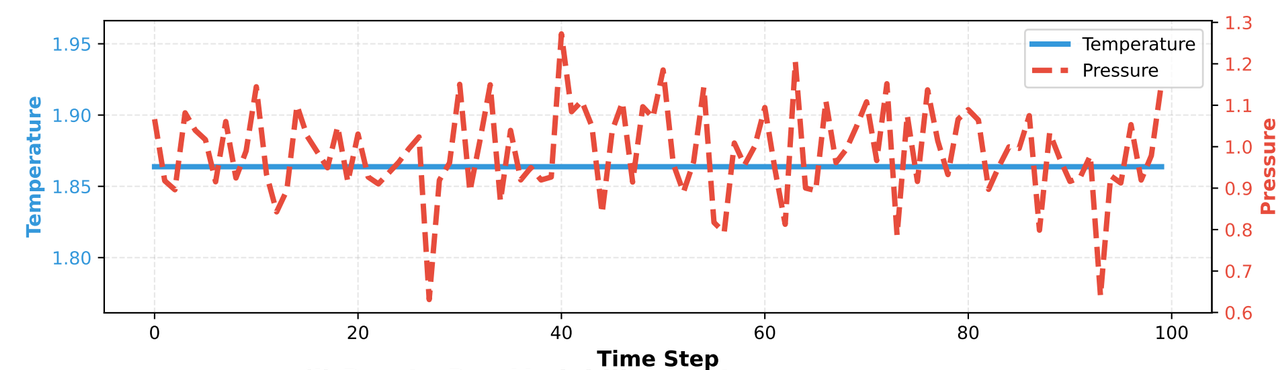
(F) Numerical Stability by Run
Consistency Assessment



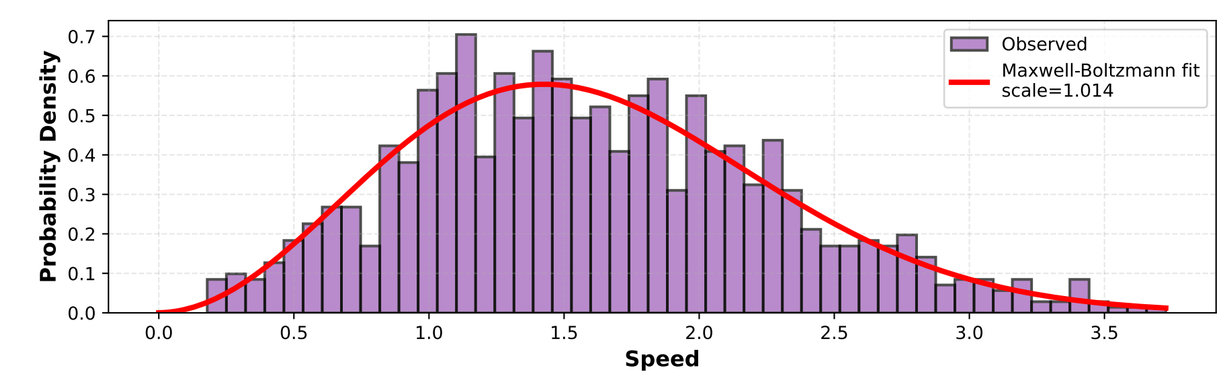
(G) Phase Space Trajectory
Dynamical Evolution



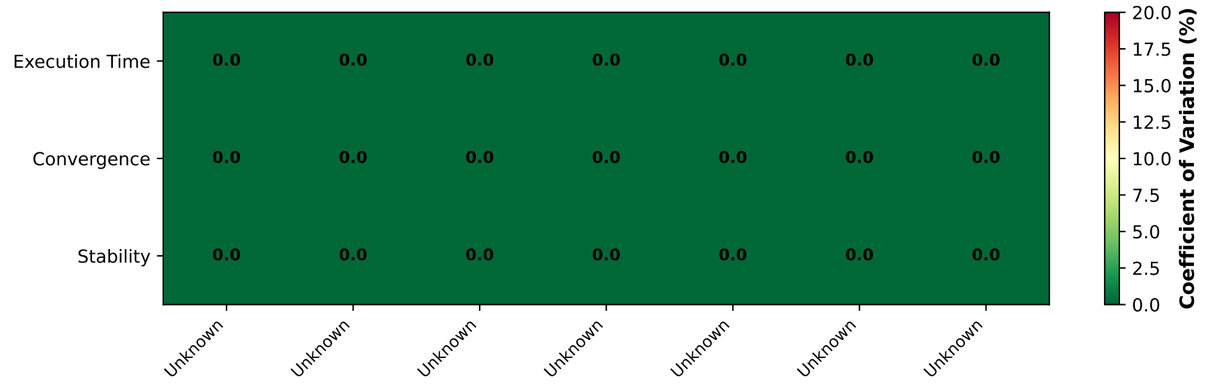
(H) Thermodynamic Properties Evolution
Temperature and Pressure



(I) Velocity Distribution
Maxwell-Boltzmann Statistics



(J) Run-to-Run Variability Heatmap
Coefficient of Variation by Component

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SIMULATION TEST MULTI-RUN ANALYSIS SUMMARY

DATASET OVERVIEW:
Total simulation runs:     3
Components per run:        7
Total measurements:        21
Date range:                20251011_070821 to 20251108_231401

EXECUTION PERFORMANCE:
Overall mean time:         0.000000 s
Overall std time:          0.000000 s
Cross-run CV:              nan%
Min execution time:        0.000000 s
Max execution time:        0.000000 s

CONVERGENCE METRICS:
Overall mean:              0.000000
Overall std:               0.000000
Cross-run CV:              nan%
Convergence quality:       ACCEPTABLE

ITERATION STATISTICS:
Mean iterations:           0
Std iterations:            0
Min iterations:            0
Max iterations:            0

STABILITY ANALYSIS:
Overall mean:              0.000000
Overall std:               0.000000
Cross-run CV:              nan%
Stability rating:          ACCEPTABLE

PARTICLE SIMULATION:
Number of particles:       1,000
Timesteps:                 100
Mean particle speed:       1.6112
Mean particle energy:      0.9420
Energy conservation:       0.2108%

REPRODUCIBILITY:
Execution time CV:         nan% ✓ GOOD
Convergence CV:            nan% ✓ GOOD
Stability CV:              nan% ✓ GOOD

Overall assessment:        REPRODUCIBLE
```