Parameter Optimization Report: Emergent Gravity from Quantum Collapse

# Final Optimized Configuration

Best parameters found:  
 collapse\_rate: 0.2943  
 collapse\_sigma: 0.1696  
 collapse\_amplitude: 0.6338  
 continuous\_noise\_amplitude: 0.0070  
 density\_decay: 0.9830  
 relativistic\_factor: 0.0022  
Estimated noise exponent (slope): -3.905  
Fitness: -1.0947

# Optimization Process Summary

The evolutionary optimization was run for multiple iterations. The fitness function was defined as -|slope + 5|, targeting a noise exponent of -5. Parameter ranges were iteratively refined around the top-performing configurations. The final best configuration is shown above.

# Next Steps

1) Run higher-resolution and longer-duration simulations using the optimized parameters.  
2) Validate robustness by comparing multiple independent runs.  
3) Run control simulations to ensure the emergent behavior is not an artifact.  
4) Compare the predicted noise spectrum with experimental data from short-range gravity experiments.