ToE / QIT Prototype Simulation: Information-Field Coupling to a Weak-Field Gravity Solver

Dimensionless proof-of-implementation (Prototype Mode) — 2026-01-02

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This document reports a **toy, dimensionless numerical prototype** implementing the one-pager model shown in Fig. 1. It demonstrates internal code consistency and produces field maps and derived acceleration fields. It **does not constitute experimental evidence** of gravity modification, anti-gravity, or time travel, and it is not calibrated to SI units or constrained by known gravitational measurements.

Fig. 1. ToE Simulation One-Pager (model/spec reference).

1. Model implemented

Core idea: evolve an information-density scalar field **s(x,y,t)** under diffusion + damping, convert it into an effective information density, then solve a Poisson equation for a gravitational potential and derive an acceleration field.

Information-field evolution

ds/dt = D * Laplacian(s) - T * s

Effective densities
rho_info = alpha * s + beta * |grad s|^2
lambda_info = lambda0 + chi * s

Weak-field gravity closure (periodic domain)
Laplacian(phi) = 4*pi*G*(rho_matter + rho_info) - 0.5*lambda_info
g = - grad(phi)

2. Numerical method

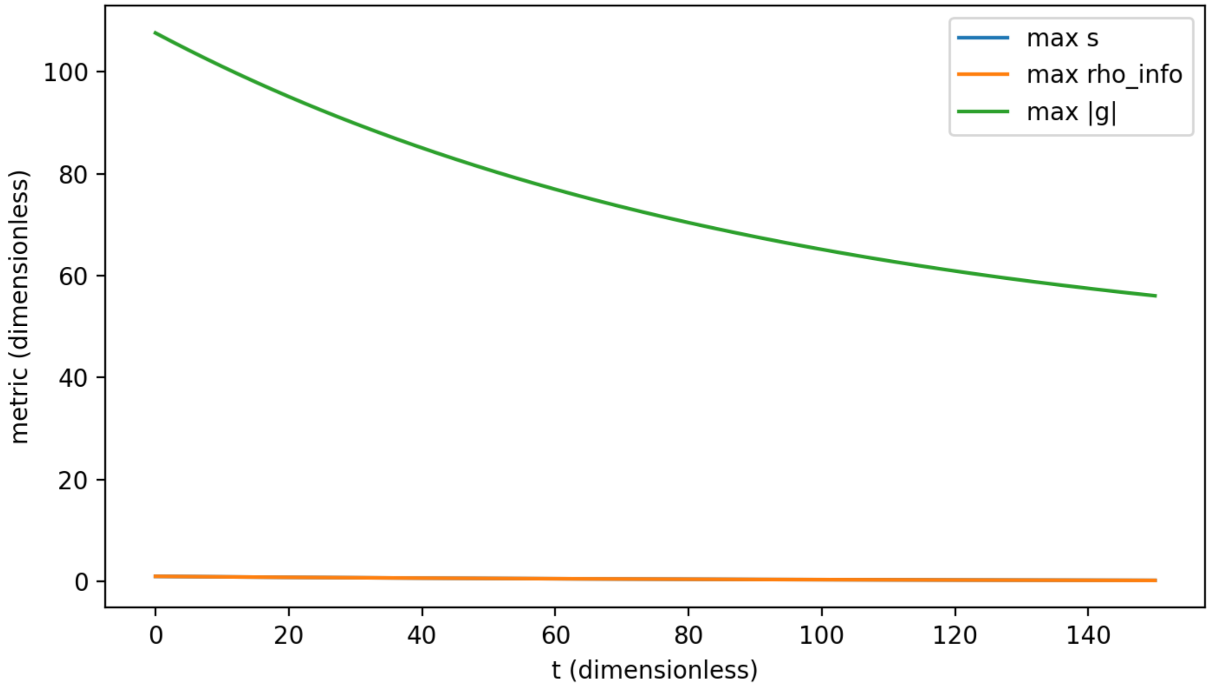
Domain: 2-D periodic grid with FFT-based derivatives and Poisson solver. Time integration: explicit Euler for s. To ensure solvability of the periodic Poisson equation, the RHS is mean-subtracted each step (equivalent to setting the k=0 Fourier mode of phi to zero).

Parameter	Value	Notes
Grid	256x256 periodic	Periodic boundary conditions
dx	1	Dimensionless spacing
dt	0.5	Stability limit dt <= dx^2/(4D) = 12.5
Steps	300	Total simulated time t = 150
D	0.02	Diffusion coefficient
T	0.01	Linear damping
alpha	1	s -> rho_info weight
beta	0.2	|grad s|^2 weight
chi	0.3	s -> lambda_info coupling
lambda0	0	Baseline lambda_info
G	1	Gravitational coupling (prototype)
rho_matter	Fixed Gaussian	Added for comparison; not required by the one-pager

3. Results

Key observation: as diffusion + damping relax s over time, rho_info decreases and the derived potential/acceleration fields decrease in magnitude. Representative field maps are shown for t = 0, 25, 75, 150.

Fig. 2. Time series of max(s), max(rho_info), and max(|g|).

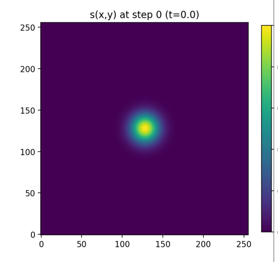
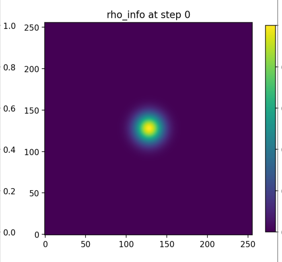
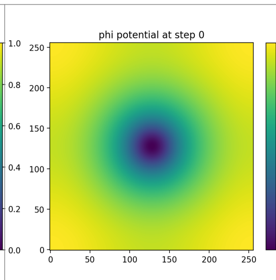
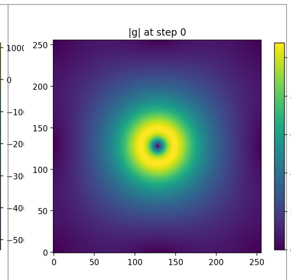
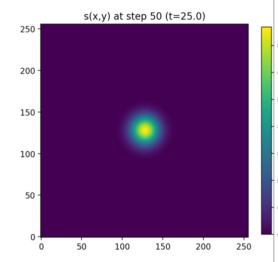
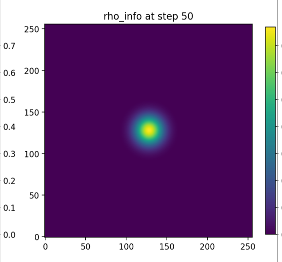
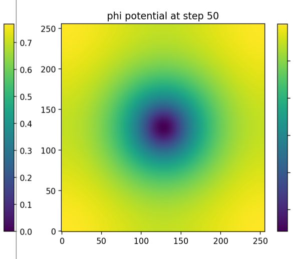
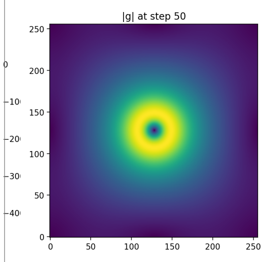
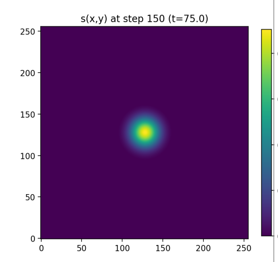
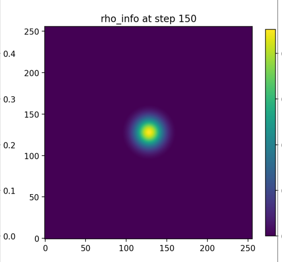
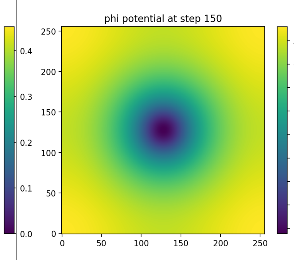
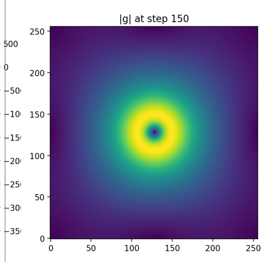
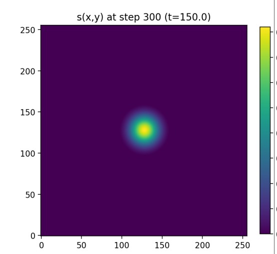
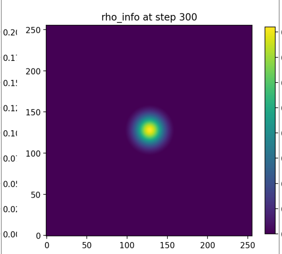
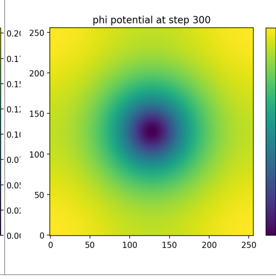
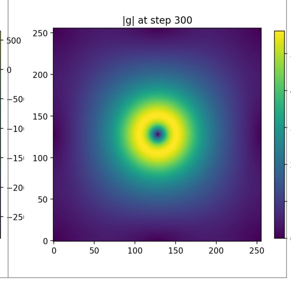


Metric	t=0	t=150
max(s)	1.000	0.205
max(rho_info)	1.000	0.205
max(|g|)	107.62	56.05
phi range (min..max)	-5317.3..1145.5	-2868.4..650.8

4. Field maps (snapshots)

Each row shows (left-to-right) s, rho_info, phi, and |g| at the indicated time. All quantities are dimensionless. Patterns reflect the initial Gaussian lump and its relaxation under diffusion/damping.

Time	s	rho_info	phi	|g|

t=0				
t=25				
t=75				
t=150				

5. Interpretation and limitations

What this does show: the one-pager can be implemented coherently as a PDE + Poisson solve; the information field produces a well-defined potential and acceleration field; and the system behaves qualitatively as expected (fields relax as s diffuses/decays).

What this does NOT show: any real-world gravity modification. The simulation is **not** tied to SI units, not constrained by experimental constants, not compared to GR predictions or gravimetry data, and not falsifiable until parameters are mapped to measurable observables.

Also note: periodic boundary conditions and mean-subtracted Poisson RHS enforce a zero-mean potential. Different boundary choices (open/Dirichlet/Neumann) can change the qualitative appearance of phi.

6. Next steps to make it testable

1) Choose a measurement target (e.g., torsion balance, atom interferometer, superconducting gravimeter) and define an observable (delta-g at a sensor, phase shift, or differential acceleration).
2) Map s and rho_info to physical units (J/m^3 or kg/m^3 equivalent) with an explicit coupling constant to G.
3) Add a null-model and nuisance terms (thermal drift, EM pickup, vibration) and show parameter recovery on synthetic data.
4) Publish simulation code + parameter sweeps + identifiability analysis; then register a small benchtop pilot with pre-registered criteria.

Appendix: Reproducibility notes

Implementation details: FFT derivatives (spectral gradients and Laplacian) on a 256x256 grid; explicit Euler update for s; FFT Poisson solve with k=0 mode set to zero. Initialization: Gaussian lump for s; optional fixed Gaussian rho_matter for comparison. All plots and tables in this PDF were generated from the same run.