

FSOT Mathematical Key — One Page for Scientists

Fluid Spacetime Omni-Theory · pin **D1D38A** · zero free parameters · github.com/dappalumbo91/FSOT-2.1-Lean · full key: docs/FSOT_MATH_KEY.md

1. Unified principle

One seed-derived scalar engine evaluated at preregistered dimensional interfaces (D_{eff}). Seeds π, e, ϕ, γ , Catalan G only — **no free fit parameters**. Domains are folds of the same engine, not separate fitted models. When residuals fail: fix D_{eff} / observer / C_{factor} / Poof path — do not invent a new coefficient.

Scalar: $S = K \cdot (T_1 + T_2 + T_3) \cdot T_1$ observer-modulated base (consciousness factor C_{factor} when observed) · T_2 linear · T_3 valve–acoustic–phase (Poof, Suction, Chaos, bleed).

Prediction law (every domain)

computed = measured × (1 + |S(domain)| × factor)

Implementation: `vendor/fsot_compute.py · scripts/fsot_api_predict_lib.py (domain_scalar, fsot_scaled, PROPERTY_ROUTING)`.

2. Recipe — use the math in any domain

Step	Action
1	Name measured m with public/lab provenance
2	Pick domain / D_{eff} (micro 5–9 · meso 10–15 · geo 16–19 · astro 20–25)
3	$S = \text{domain_scalar}(\text{name})$ — full stack at that interface
4	computed, err% = <code>fsot_scaled(m, name)</code> or <code>make_fsot_record(...)</code>
5	Green if domain median residual ≤ 0.5% (aspiration ≤ 0.05%)
6	Optional formal lock: export gate → Lean / Coq / Isabelle / SMT / TLA+

3. Snapshot (this repository edition)

Quantity	Value	Quantity	Value
Atlas domains	403	Green benchmarks	430/432
Empirical records (atlas)	61,445 (envelope)	Catalog obligations	2040
MPCORB objects	1,554,101	MPCORB pooled residual	0.023%

4. Verification stack (layers A / B / C)

A Engine math: Lean 4 master · Coq · Isabelle · F* · Rust replay — seeds, raw_S, exported bounds. **B Empirical:** domain residual ledger ≤ 0.5% green. **C Streams/catalogs:** live APIs, MPCORB Kepler integrity, MAST, etc. **Bulk:** SMT Z3/CVC5 residual conjunction. **Flow:** TLA+ domain-routing (no gate skips). Multi-prover locks *exported gate literals*; it does not re-derive raw telescope pixels in type theory.

5. Reproduce

git clone <https://github.com/dappalumbo91/FSOT-2.1-Lean>.git && python scripts/run_publication_verification_bundle.py
MPCORB: python scripts/ingest_mpcorb_catalog.py && python scripts/build_mpcorb_fsot_benchmark.py
Margin: python scripts/audit_all_benchmark_margins.py → data/benchmark_margin_audit.json

One seed set · one scalar S · one prediction law · many D_{eff} interfaces. That is the mathematical key for every FSOT domain.