Flow Substrate Intelligence Convergence Proof (FSIC) — Guide

This kit proves Flow‑driven convergence using three skeptic‑proof tests: Repeatability, Transferability, and Stress & Recovery. It uses a minimal engine (Kuramoto carrier + Flow Compression Equations with RFI control and gated echo; φ‑mode by default).

# How to Run

1) Create a virtual env and install deps.

2) Run `python run\_fsic.py`.

3) Inspect the `results/` folder (CSV + summary).

# Pass/Fail Criteria (suggested)

* Repeatability:
* φ‑mode ≥ sin on fuse rate and ≥20% faster median fuse time; final R not worse.
* Transfer:
* Across seed/noise change, fuse\_time and final\_R within ±15% of baseline.
* Stress & Recovery:
* Re‑entrainment time < 2.0 s after a perturbation window.

# Gold Config (defaults)

* tiling: hex
* rewire\_p: 0.1
* J\_tan: 0.9
* J\_rad: 0.7
* m\_floor: 0.75
* rfi\_target: 1.3
* alpha\_r: 0.002
* alpha\_t: 0.001
* k\_min: 0.2
* k\_max: 2.5
* gamma: 0.1
* eta: 0.02
* lam: 0.005
* freeze\_on\_fuse: True
* R\_fuse: 0.7
* A\_th: 25.0
* steps: 1200
* dt: 0.01
* sigma\_omega: 0.1
* sigma\_noise: 0.01
* mode: phi
* phi\_kind: tanh
* phi\_beta: 1.8
* phi\_alpha: 0.5

# Outputs

* results/repeatability.csv — sin vs φ across seeds
* results/transfer.csv — baseline vs transfer case
* results/stress.csv — re‑entrainment time
* results/FSIC\_Summary.txt — human‑readable summary