APL Seven Sentences Test Pack

APL Working Notes

v1.0

Abstract

This protocol translates seven compact APL sentences into falsifiable, cross-domain hypotheses testable with standard models across geometry, waves, chemistry, and materials.

1 Sentences

Each entry is of the form `[Direction][Op]|[Machine]|[Domain]`.

- A3: `u^|Oscillator|wave`
- A7: `u%|Reactor|wave`
- A1: `d()|Conductor|geometry`
- A4: `m×|Encoder|chemistry`
- A5: `u×|Catalyst|chemistry`
- A6: `u+|Reactor|wave`
- A8: `m()|Filter|wave & d×`

2 Interpretation Rule

If a system is built to match the LHS structure and driving, then the RHS regime should appear more often, more strongly, or at lower thresholds than in matched controls.

3 Testing Strategy

1. Choose standard models: phase-field, Cahn–Hilliard, curvature flow (geometry); Navier–Stokes, lattice Boltzmann, wave equation (flows/waves); reaction–diffusion, polymerization, DLA, KMC (chemistry).
2. Implement LHS conditions: gain at resonant modes (u^); stochastic forcing (u%); boundary relaxation (d()); modulation of boundaries (m()); forward or collapse fusion catalysts (u×/d×); grouping fields/geometry (u+).
3. Design matched controls by removing or inverting the key operator while keeping other conditions comparable.

4. Define regime metrics: A1 sphericity/SV ratio/isotropy; A3 vortex count/lifetime/closed streamlines; A4 helical order/info capacity; A5 fractal dimension/branching; A6 jet angles/coherence; A7 spectral width/RMS/Lyapunov; A8 adaptive sharpening/retuning.

5. Sweep parameters (drive, noise, tension, catalytic bias) and run multiple realizations; quantify bias toward target regimes.

4 Preliminary Checks

A1: 2D isotropic collapse yields circular, angle-isotropic cluster.
A5: 2D DLA produces fractal branching ($D \approx 1.2$).

5 Reporting

Report both confirmations and refutations. Negative results that fail to show bias under LHS are evidence against APL.