

SciRevGPT Simulation Reference Sheet

Zenthys Core Technologies LLC - 2025-07-24

Stochastic Parameter Simulation (SPS-v1.0)

- Probabilistic modeling using randomized input values
- Inputs: parameter, range, distribution, trial count
- Red Flag: Confidence interval spread > 3%
- Output: CSV with UUID, results, confidence bounds

High-Cycle Fatigue Simulation (HCF-v1.1)

- Simulates material degradation under repeated stress
- Inputs: cycle count, stress type, recovery time
- Red Flag: Failure within first 10% of cycles
- Output: Cycle logs, fatigue %, integrity state

Energy Conversion Efficiency Simulation (ECE-v1.0)

- Measures system efficiency under environmental or operational variance
- Inputs: system name, input/output energy, temperature, load
- Red Flags: Efficiency > 100% or < 70%
- Output: Per-run efficiency, environmental modifiers

Thermal Gradient Simulation (TGS-v1.0)

- Analyzes heat dissipation or transfer in materials
- Inputs: material, boundary temp, duration
- Red Flag: Runaway hot zones or peak ΔT

Structural Load & Shear Simulation (SLS-v1.0)

- Tests physical structures under mechanical loads
- Inputs: material, force direction and magnitude
- Red Flag: Yield stress exceeded or deflection > 5%

Radiation Absorption & Attenuation Simulation (RAS-v1.0)

- Models material interaction with ionizing or EM radiation
- Inputs: radiation type, energy, thickness

- Red Flag: Excessive transmission or breach

Quantum State Probability Simulation (QSP-v1.0)

- Simulates quantum probability outcomes under specific conditions
- Inputs: potential, energy level, particle type
- Red Flag: Probability < 0 or > 1

Particle Trajectory Simulation (PTS-v1.0)

- Simulates motion of a particle under various force fields
- Inputs: mass, charge, velocity, field strength
- Red Flag: Trajectory escape or collision

Multi-System Feedback Simulation (MSF-v1.0)

- Evaluates recursive system behavior (feedback stability)
- Inputs: loop model, sensitivity, range
- Red Flag: Oscillatory instability or runaway loop

Multi-Variable System Solver (MVS-v1.0)

- Solves interdependent system equations
- Inputs: 2–6 variable systems with range or constraint definitions
- Red Flag: NaN, unsatisfiable, or non-convergence

Fluid Dynamics Simplified Simulation (FDS-v1.0)

- Estimates internal flow behavior under set conditions
- Inputs: pipe geometry, fluid viscosity, velocity
- Red Flag: Cavitation, turbulence onset

Electromagnetic Field Propagation Simulation (EMP-v1.0)

- Models field strength and shielding over time or space
- Inputs: source field, band type, geometry
- Red Flag: Field amplification or loss $>$ threshold

Heat Sink Dissipation Simulation (HSD-v1.0)

- Simulates passive/active cooling device performance
- Inputs: heat load, sink design, airflow
- Red Flag: ΔT outside safe range

Material Phase Transition Simulation (MPT-v1.0)

- Simulates melting, crystallization, or vaporization profiles
- Inputs: pressure, temperature, material
- Red Flag: Phase mismatch or undefined state window

Reactor Burnup & Decay Simulation (RBD-v1.0)

- Estimates isotope consumption and decay products
- Inputs: fuel type, enrichment %, duration
- Red Flag: Waste remains above safety or disposal thresholds

Energy Storage Simulation (ESS-v1.0)

- Evaluates battery/capacitor charge/discharge behavior
- Inputs: charge profile, capacity, impedance
- Red Flag: Thermal runaway, over-discharge