BADGER'S LAW — Draft 7.1 Findings

1. Theory Overview

- Concept: Replace static 2D golden ratio curve with a time-evolving 3D spiral.
  Spiral parameterization:
  $s_i(t) = \phi^t [\cos(\omega_i t), \sin(\omega_i t), t]$,
  where $\phi = (1+\sqrt{5})/2$ (golden ratio), ω_i are angular velocities.
- Phase tension metric V(t):
  $V(t) = a * (|e^{i\omega 1 t} - e^{i\omega 2 t}| + |e^{i\omega 2 t} - e^{i\omega 3 t}| + |e^{i\omega 3 t} - e^{i\omega 1 t}|)$,
  quantifies instantaneous phase misalignment among spirals.

2. Math and Simulation Recap

- Equilateral Lagrange simulation:
  - Initial positions: equilateral triangle of unit side.
  - Velocities set for stable circular motion.
  - V(t) computed from projected angular phases.
  - Result: V(t) nearly flat until collapse, indicating coherence.
- Parameters used:
  G=1, m_i=1, dt=0.005, t_max=10.
  V(t) dips detected: none (perfect phase-lock).

3. Next Questions / Steps

1. How does V(t) behave under a perturbation-rich three-body setup?
2. Which close-encounter times correspond to dips in V(t) in chaotic scenarios?
3. Can we correlate dip times with known resonance conditions (e.g., 2π multiples)?
4. What is the sensitivity of V(t) to mass ratios and initial geometric configurations?