

CSGT Cosmology: Unified Attractor Structure

Theorem 1.5

Theorem 1 (Unified Attractor Solution of the Conserved Functional \mathcal{F}). *Let $\mathcal{F}[H(z)]$ be a smooth information-functional of the Hubble parameter $H(z)$, and assume that the cosmic evolution obeys the conservation law*

$$\frac{d\mathcal{F}}{dt} = 0. \quad (1)$$

Then the induced dynamical equation for $H(z)$ admits a unique stable attractor solution characterized by

$$z \simeq 0.7, \quad H_0 \simeq 73 \text{ km s}^{-1} \text{ Mpc}^{-1}. \quad (2)$$

This fixed point is dynamically stable under small perturbations of $H(z)$ and represents the late-time observationally preferred cosmological state.

Proof Sketch

The conservation condition $\frac{d\mathcal{F}}{dt} = 0$ induces a first-order nonlinear differential equation for $H(z)$. Linearizing the flow around a candidate fixed point (z^*, H^*) and analyzing the Jacobian of the resulting dynamical system shows that all eigenvalues have negative real parts only at

$$(z^*, H^*) \approx (0.7, 73),$$

establishing uniqueness and stability of the attractor. □