

Dual-Sector Expansion Framework

PHOTON SECTOR

$$\beta_\gamma < 1.4 \times 10^{-6}$$

$$H_0 = 67.4 \text{ km s}^{-1} \text{ Mpc}^{-1}$$

- CMB acoustic scale
- No decoherence
- Planck measurements

**Sector
Separation**



$$\frac{\beta_\gamma}{\beta_m} < 8.5 \times 10^{-6}$$

MATTER SECTOR

$$\beta_m = 0.157 \pm 0.029 \text{ (growth)}$$

$$\beta_{\text{distance}} \approx 0 \text{ (geometry)}$$

$$H_0 = 72.5 \text{ km s}^{-1} \text{ Mpc}^{-1}$$

- Gravitational decoherence
- Structure formation

INFORMATIONAL ACTUALIZATION

Decoherence → Information

Horizon Encoding → Pressure

Structure Drives Expansion

Dark Energy = Info Production

TYPE Ia SNe (This Work)

✕ Reject $H_0 = 67.4$ (photon)

✕ Accept $H_0 = 73.04$ (matter)

✕ Maintain Λ CDM distances

Validates sector separation

Hubble Tension Resolution: Both measurements correct—they probe different sectors

Planck (photon) = $67.4 \text{ km s}^{-1} \text{ Mpc}^{-1}$ • SH0ES (matter) = $73.04 \text{ km s}^{-1} \text{ Mpc}^{-1}$