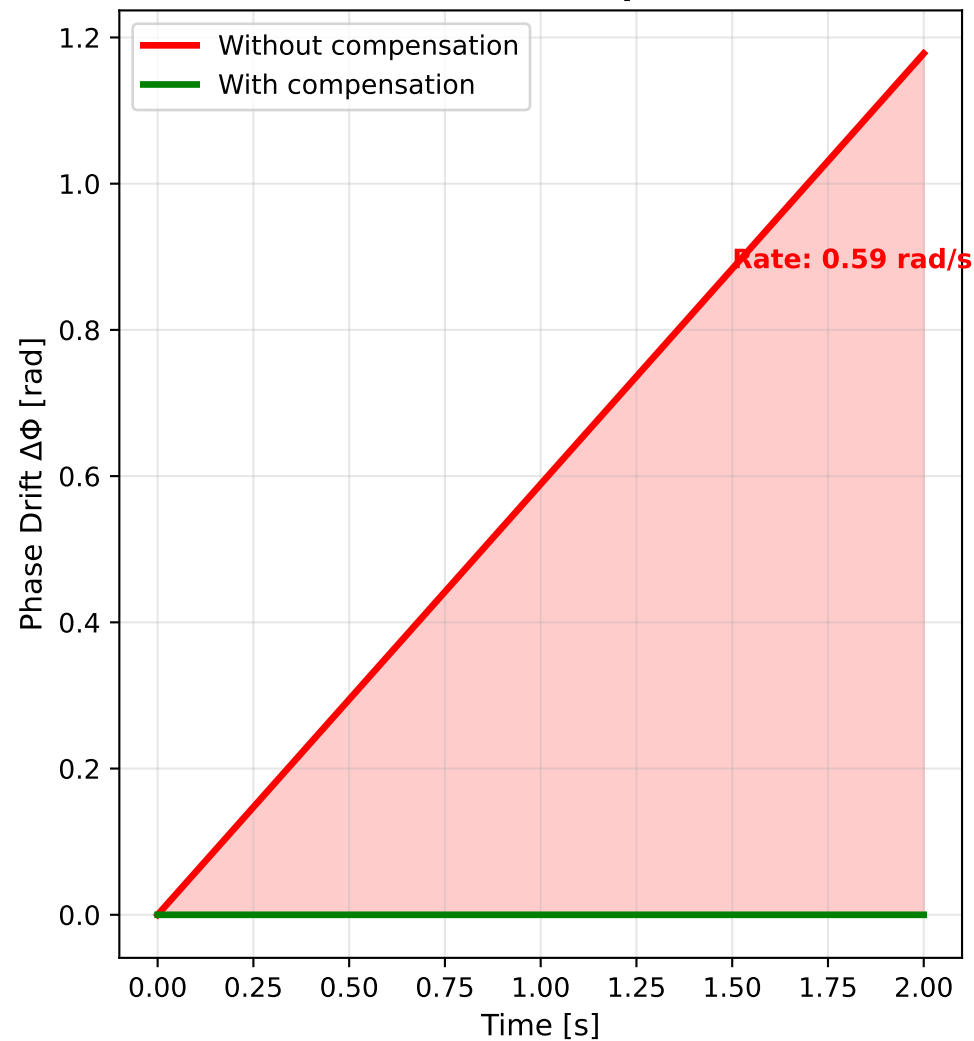
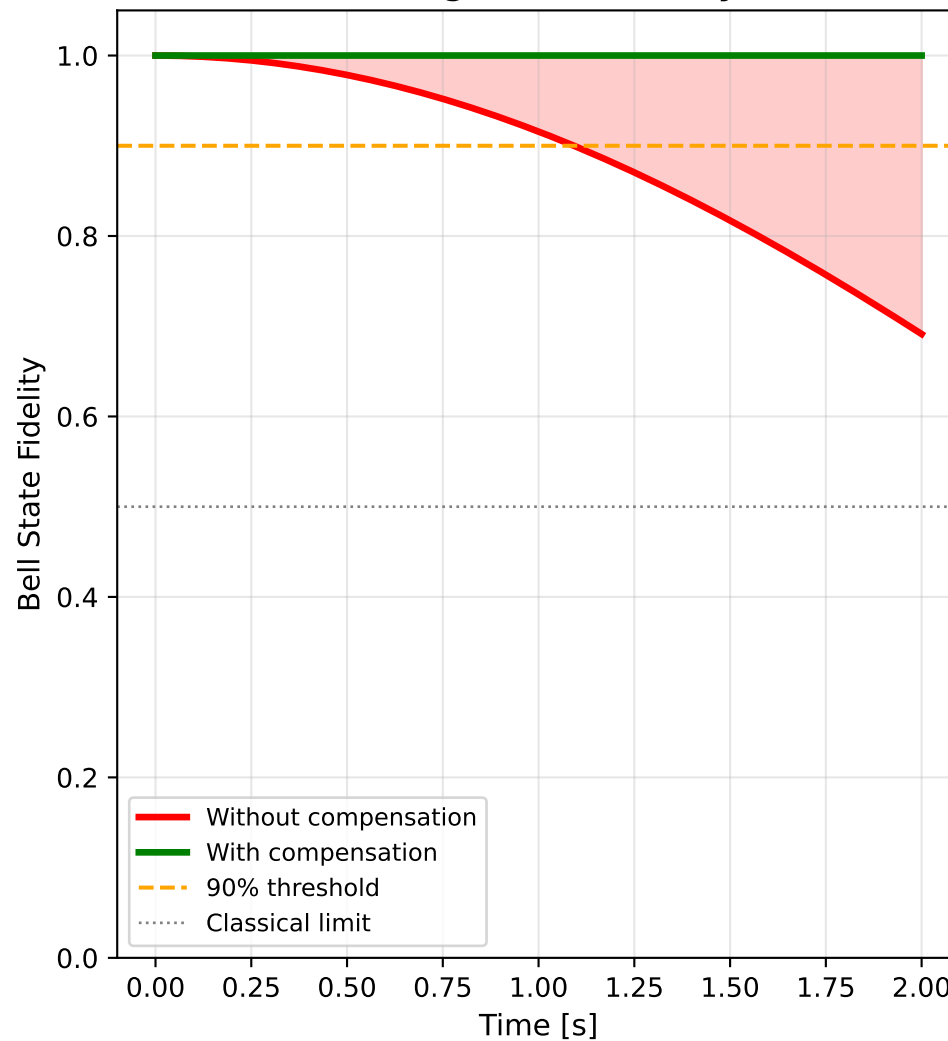


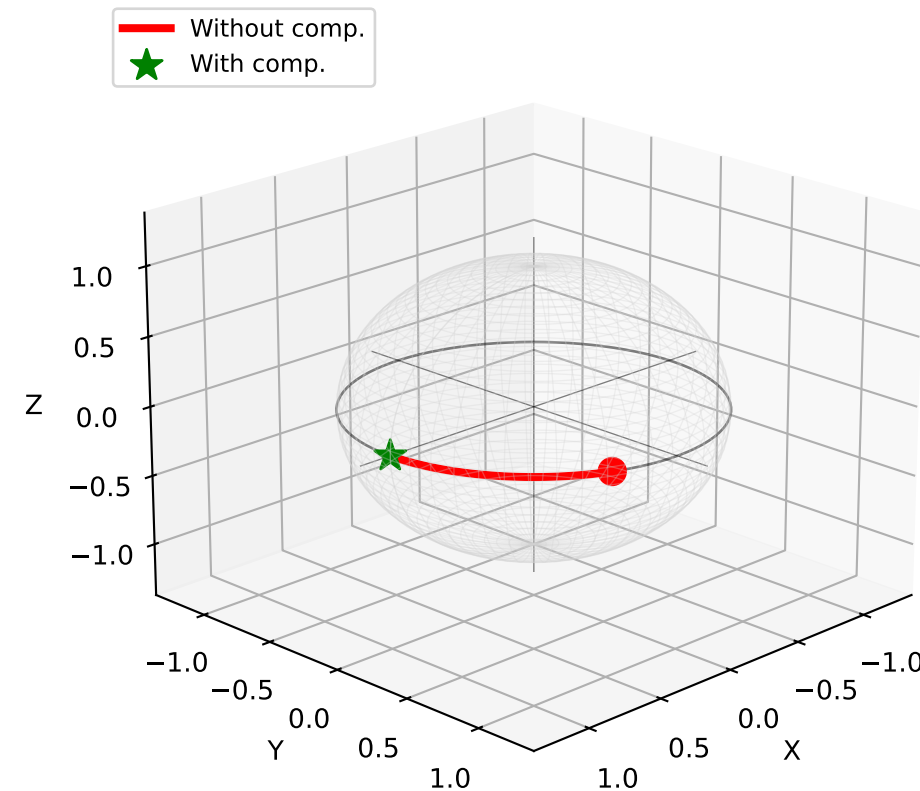
## Phase Accumulation ( $\Delta h = 1$ m, 429 THz Optical Clock)



## Entanglement Fidelity



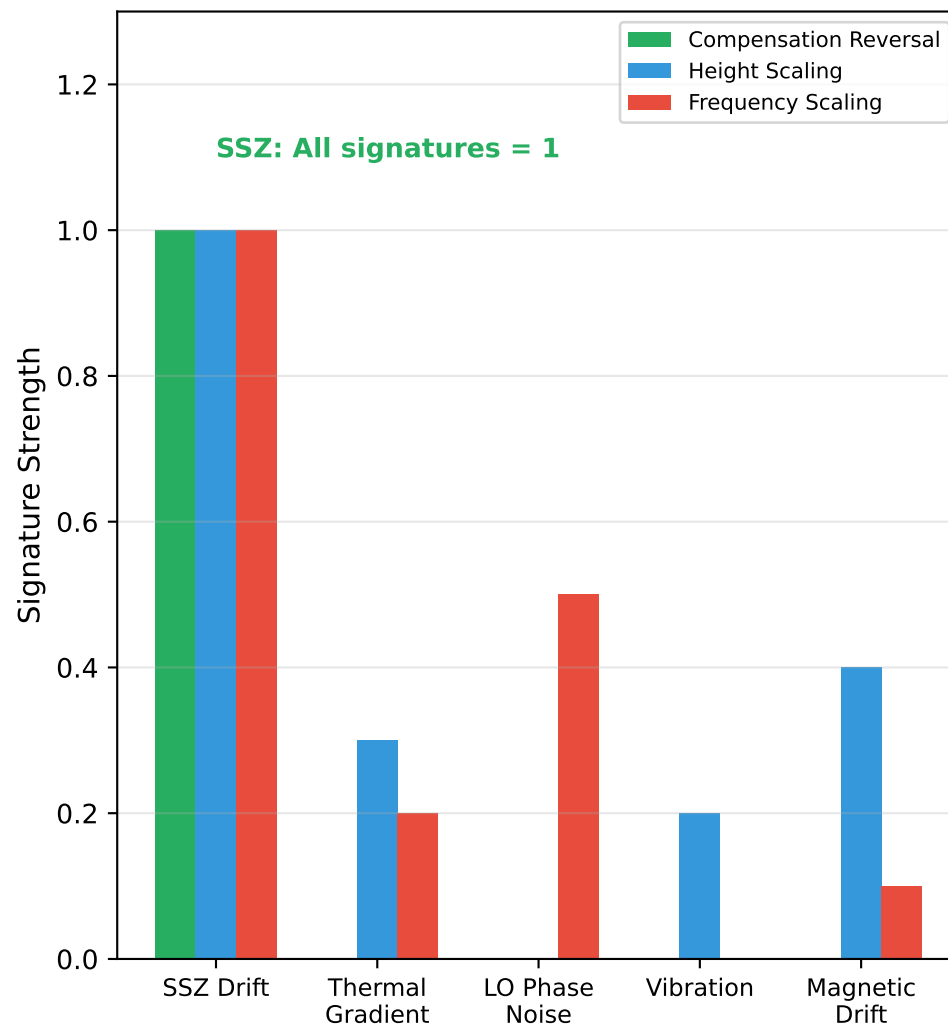
## Bloch Sphere (State Evolution)



## Protocol Steps

- PREPARE**  
Bell state  $|\Phi^+\rangle = (|00\rangle + |11\rangle)/\sqrt{2}$   
at heights  $h$  and  $h + \Delta h$
- EVOLVE (A)**  
WITHOUT compensation  
Measure phase drift  $\Delta\Phi_{\text{measured}}$
- EVOLVE (B)**  
WITH compensation  $\Phi_{\text{corr}}$   
Expect  $\Delta\Phi \approx 0$
- COMPARE**  
If SSZ:  $\Delta(A)$  matches prediction,  
 $\Delta(B) \approx 0$

## Discrimination Signatures (SSZ vs Confounds)



## Why Compensation Matters

### KEY DISCRIMINATOR

#### Compensation Reversal:

- SSZ: Apply  $\Phi_{\text{corr}} \rightarrow$  drift cancels
- Confounds: Apply  $\Phi_{\text{corr}} \rightarrow$  no effect

IF drift cancels exactly with SSZ formula, THEN gravitational coupling is confirmed.

IF drift persists, THEN confound dominates.