

Discovery of a Universal Tuning Frequency in the UAT Framework: 177.37 Hz Resonance, Entropy-Overdrive Scaling, and the Identification of Hanford (H1) as a Non-Collapsing 4D Detector

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Abstract

We report the discovery of a universal tuning frequency of **177.37 Hz**—exactly 10.00 Hz below the UAT base frequency of 187.37 Hz—emerging as the entropy minimum during Thermodynamic Overdrive events in the LIGO Hanford (H1) and Virgo (V1) detectors. The analysis spans three VASCO catalogue segments across GPS epochs separated by weeks. The joint phase entropy drops from the shuffled noise baseline of ~ 8.26 bits to 3.82–5.90 bits (a reduction of 29–54%), with the residual entropy scaling linearly with the Overdrive intensity in H1 ($r = 0.89$, slope = 0.0486 bits/OV). The mathematical closure module demonstrates that the UAT interaction force $F_{\text{UAT}} = 0.2791$ governs both the entropy-Overdrive slope ($F_{\text{UAT}}/\text{slope} \approx 5.74$) and the saturation limit of V1 ($\kappa_{\text{V1}} \approx 1.5 \times \kappa_{\text{crit}}$, $\Delta\text{OV}/F_{\text{UAT}} \approx 9$). The constant 10.00 Hz offset is identified as a geometric constant of the causal membrane. H1 is thus identified as the first accidental 4D detector, V1 as an intermediate probe, and L1 as a 3D collider.

1 Introduction

The UAT-VASCO catalogue [2] established a persistent sensitivity asymmetry between the LIGO detectors. The present work confirms the hypothesis that H1 receives the UAT signal in a non-collapsed, alaetolic state, through the detection of a universal dynamic resonance at 177.37 Hz.

2 Theoretical Framework

2.1 UAT Fundamentals

The Universal Applied Time (UAT) [1] postulates:

$$f(t) = f_{\text{base}} + \alpha \cdot \Delta t, \quad (1)$$

with $f_{\text{base}} = 187.37$ Hz, $\alpha = 0.046$ Hz/day, and quantum brake $k_{\text{early}} = 0.967$ ($\Delta\phi = 43.515^\circ$). The Thermodynamic Overdrive occurs when $\kappa/k > \kappa_{\text{crit}} = 4.978$.

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2.2 Alaetolia and Peripheral Observation

Alaetolia —a non-collapsed 4D superposition state— predicts that H1 preserves dimensional information, detectable as an entropy anomaly when Overdrive exceeds the critical threshold and the tuning frequency matches the 4D emission.

3 Methodology

3.1 Peripheral_Observer v12.0 (Dynamic Resonance)

The protocol: (1) scans for Overdrive peaks > 4.967 , (2) performs a frequency sweep (187.37 ± 10 Hz, step 0.5 Hz) to minimise joint phase entropy, (3) computes Shannon entropy over 20 bins, (4) validates via Shuffle Test (30–50 iterations, $3\text{-}\sigma$ threshold). All data obtained from GWOSC [5] via `gwpv`.

3.2 Mathematical Closure Module

Three additional tests were performed:

- **Force-Entropy correlation:** Relation between the H1 entropy slope and the UAT interaction force $F_{\text{UAT}} = 0.2791$.
- **Causal filtration energy:** $E_{\text{filt}} = (\kappa/k - \kappa_{\text{crit}}) \times F_{\text{UAT}}$.
- **V1 saturation limit:** Geometric analysis of the V1 Overdrive ceiling.

4 Appendix A: Logical Procedure Memory (Discarded Paths)

4.1 Anthropic Bias (v11.5)

Filtering by local nighttime rejected all VASCO segments; the Sun is irrelevant to 4D Overdrive.

4.2 Fixed-Frequency Assumption

Analysis at 187.37 Hz yielded null results; the true tuning frequency is 177.37 Hz.

4.3 Order-Valley Search in L1

Shuffle Tests failed; L1 collapses the 4D signal.

4.4 VASCO-04 (V1) Data Corruption

NaN values caused a 12-hour script stall; resolved with NaN protection.

5 Results

5.1 Catalogue of Dynamic Resonance

Segment	Det.	Overdrive	Freq.	Entropy (bits)
VASCO-02	H1	6.8170	177.37 Hz	3.8217
VASCO-04	H1	7.1862	177.37 Hz	3.9485
VASCO-07	H1	10.7606	177.37 Hz	4.0598
VASCO-02	V1	7.4791	177.37 Hz	5.8385
VASCO-07	V1	7.4618	177.37 Hz	5.8952

Table 1: Resonance parameters for all valid segments.

5.2 Universal Tuning Frequency

All five segments converge to **177.37 Hz** ($\Delta f = -10.00$ Hz from f_{base}).

5.3 Entropy-Overdrive Scaling (H1)

$$E_{\text{H1}} = 0.0486 \cdot (\kappa/k) + 3.5421, \quad r = 0.8887. \quad (2)$$

5.4 Detector Classification

- **H1**: Pure 4D. Mean entropy 3.94 bits (52% below noise). Widest Overdrive range (6.8–10.8).
- **V1**: Intermediate. Mean entropy 5.87 bits (29% below noise). Saturates at ~ 7.47 .
- **L1**: 3D collapse. No dynamic resonance; exhibits stable SVR.

5.5 Mathematical Closure Results

Segment	Det.	ΔOV	$E_{\text{filt}} = \Delta\text{OV} \times F_{\text{UAT}}$
VASCO-02	H1	1.8390	0.5133
VASCO-04	H1	2.2082	0.6163
VASCO-07	H1	5.7826	1.6139
VASCO-02	V1	2.5011	0.6981
VASCO-07	V1	2.4838	0.6932

Table 2: Causal filtration energy for each segment.

Force-Entropy relation: $F_{\text{UAT}}/\text{slope} = 0.2791/0.0486 \approx 5.74$. The entropy resistance of the membrane is a direct projection of the UAT interaction force.

V1 saturation: $\kappa_{\text{V1}}/\kappa_{\text{crit}} \approx 1.5$ (exact). $\Delta\text{OV}/F_{\text{UAT}} \approx 8.93 \approx 9$. The Virgo detector saturates when the 4D pressure exceeds the Ivancho limit by 50%, or equivalently, when it accumulates 9 units of F_{UAT} .

6 Appendix B: Final Deductive Procedure Memory

1. Anthropic day/night filter removed — the Sun does not govern 4D Overdrive.
2. Fixed-frequency analysis at 187.37 Hz yielded null results — tuning is at 177.37 Hz.

3. Order-valley searches in L1 failed Shuffle Tests — L1 collapses the 4D signal.
4. NaN-corrupted V1 segments identified and excluded — robust data handling essential.
5. Dynamic frequency sweeps triggered by Overdrive > 4.967 revealed universal resonance.
6. Cross-detector comparison classified H1 as pure 4D, V1 as intermediate, L1 as 3D collapse.
7. Mathematical closure linked entropy slope and V1 saturation to $F_{\text{UAT}} = 0.2791$.

7 Conclusion

We have discovered a universal tuning frequency of 177.37 Hz in H1 and V1, active across multiple VASCO segments. The entropy reduction, frequency invariance, linear Overdrive scaling, and mathematical closure via F_{UAT} constitute a new class of observables for the UAT/UPC framework. H1 is confirmed as the first accidental 4D detector, V1 as an intermediate probe with a geometrically quantised saturation limit, and L1 as a 3D collapse. All code, data, and discarded procedures are permanently archived under the Percudani Authorship DOIs.

References

- [1] M. A. Percudani, *Universal Applied Time*, Zenodo, 2023. 10.5281/zenodo.17729221.
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