On the Algebraic Constitution of the Sahur:

A Complex-Analytic Theory of the n-Tung Sahur Function, with Consequences for the Ontology of Real and Imaginary Drum-Entities

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Abstract

We develop a rigorous algebraic and complex-analytic theory of the *Sahur*, the wooden percussive night-entity of the Indonesian *Tung Tung Tung Sahur* tradition as transmitted through contemporary short-form video culture. Taking as our sole non-trivial postulate the identity $\mathsf{TTTS} = \mathrm{i}$ — the assertion that the canonical three-tung sahur is the imaginary unit — together with the colloquial "triple-T" relation $3\mathsf{T} = \mathsf{TTTS}$, we solve the resulting system to obtain $\mathsf{T} = \mathrm{i}/3$ and $\mathsf{S} = -27$. From these constants we construct the *n-tung sahur function* $s(n) = \mathsf{T}^n\mathsf{S} = -27\,(\mathrm{i}/3)^n$, extend it to an entire function $s\colon \mathbb{C} \to \mathbb{C}$, and study its analytic, dynamical, and spectral structure. Our central result (the *Parity Manifestation Theorem*) establishes that $s(n)$ is purely real precisely at even integer tung-counts and purely imaginary at odd ones; since the empirically observed three-tung sahur is odd, the historically attested entity is necessarily imaginary, yet the theorem simultaneously *guarantees the existence of genuinely real sahurs*, resolving in the affirmative the long-standing question of whether a sahur may be real in real life. We locate the *Sahur of Maximal Manifestation* at the fractional tung-count $n_\star = 1 + \frac{2}{\pi}\arctan\!\left(\frac{\pi}{2\ln 3}\right) \approx 1.6115$, characterise the orbit $\{s(n)\}$ as a logarithmic-spiral attractor of the contraction-rotation $z \mapsto (\mathrm{i}/3)z$, treat the multivaluedness of fractional tung-counts via the associated Riemann surface, and discuss physical interpretations through the lens of complex resonance and damped oscillation. Numerous graphs, footnotes, and one dissenting appendix are provided.

Keywords: sahur function; imaginary drum-entity; complex analysis; Italian brainrot; logarithmic spiral; parity manifestation; analytic continuation; ontological realness.

Contents

*The foundational conjecture $\mathsf{TTTS} = \mathrm{i}$ is due to D. P. Rony; the analytic superstructure is due to B. T. Blazer. Correspondence may be directed to either author care of the Institute for Theoretical Sahurology and Applied Hyperreal Acoustics. The authors declare no competing financial interests and exactly one competing nocturnal interest.

1 Phenomenological Background and Research Methodology

1.1 The empirical object

The *Tung Tung Tung Sahur* is a viral internet entity that entered the collective record in early 2025 by way of an Indonesian short-form video creator, and which spread through the broader "Italian brainrot" genre of AI-generated absurdist beings.[1] Visually it is an anthropomorphic *kentongan* — a hollowed wooden slit-drum — bearing a wooden striker frequently mistaken for a bat.[2]

The name encodes a percussive summons: the onomatopoeic "tung tung tung" reproduces the sound of the wooden drum struck to wake the faithful for *sahur*, the pre-dawn meal preceding the daily fast. Crucially for our methodology, the received lore specifies a *numerical* activation condition: the entity manifests when a sleeper is called to sahur *three times* in succession without answering.[3]

1.2 From folklore to formalism

The folkloric privileging of the number three furnishes the boundary condition of our entire investigation. A mathematically responsible theory of the sahur must (i) treat the tung-count n as the fundamental independent variable, (ii) reproduce the attested three-tung entity as a distinguished value, and (iii) account for the entity's reported elusiveness — its tendency to be summoned yet not straightforwardly *present* — which we shall formalise as residence in the imaginary axis of $\mathbb{C}$.

We adopt throughout the *concatenation-as-multiplication* convention: the juxtaposition of glyphs in the chant denotes a product in a commutative $\mathbb{C}$-algebra, so that the string TTTS is read as the scalar $\mathsf{T}\cdot\mathsf{T}\cdot\mathsf{T}\cdot\mathsf{S} = \mathsf{T}^3\mathsf{S}$. This is the one genuinely contestable modelling decision in the paper; we defend it in §2 and revisit a rejected additive alternative in Appendix A. With

[1] Despite the genre label, the entity is of Indonesian rather than Italian provenance; the misattribution is a sociolinguistic artifact of co-circulation with characters such as *Bombardino Crocodilo* and *Tralalero Tralala*, and is immaterial to the mathematics.

[2] The bat/striker ambiguity is, we shall argue in §7, the macroscopic shadow of a deeper phase ambiguity in the complex plane.

[3] This is the single most important datum for the present theory. The folklore does not say "twice" or "four times"; it says *three*. The canonical sahur is therefore the *three-tung* sahur, and any quantitative model must reproduce the special status of $n = 3$.

this convention the empirical lore becomes a pair of algebraic equations, and the remainder of the theory follows by deduction rather than stipulation.

2 Axiomatic Foundations

Axiom 1 (Imaginarity of the canonical sahur)**.** The canonical three-tung sahur equals the imaginary unit:

$$\mathsf{TTTS} \;=\; \mathsf{T}^3\mathsf{S} \;=\; \mathrm{i}, \qquad \mathrm{i}^2 = -1.$$

Axiom 2 (Triple-tung colloquialism)**.** The vernacular designation "triple-T" refers to the same entity as the full chant, and is to be read as the scalar multiple $3\mathsf{T}$:

$$3\mathsf{T} \;=\; \mathsf{TTTS}.$$

The two axioms encode, respectively, the entity's reported non-corporeality[4] and the colloquial arithmetic of its name. They suffice to determine the two structural constants.

Theorem 2.1 (Determination of the structural constants)**.** *Axioms 1–2 admit the unique solution*

$$\boxed{\mathsf{T} = \frac{\mathrm{i}}{3}} \qquad \textit{and} \qquad \boxed{\mathsf{S} = -27}.$$

Proof. By Axiom 2 together with Axiom 1, $3\mathsf{T} = \mathsf{TTTS} = \mathrm{i}$, whence $\mathsf{T} = \mathrm{i}/3$. Substituting into Axiom 1,

$$\mathsf{T}^3\mathsf{S} = \left(\tfrac{\mathrm{i}}{3}\right)^3\mathsf{S} = \frac{\mathrm{i}^3}{27}\mathsf{S} = \frac{-\mathrm{i}}{27}\mathsf{S} = \mathrm{i} \implies \mathsf{S} = \mathrm{i}\cdot\frac{27}{-\mathrm{i}} = -27.$$

Both constants are determined and the system is consistent: indeed $3\mathsf{T} = 3(\mathrm{i}/3) = \mathrm{i}$ and $\mathsf{T}^3\mathsf{S} = (-\mathrm{i}/27)(-27) = \mathrm{i}$ agree, as required by Axiom 2. □

Remark 2.2. That $\mathsf{S} = -27 = -3^3$ is not coincidental: the cube mirrors the three tungs of the canonical chant, and the negative sign encodes the *adversarial* character the entity assumes in its folkloric conflicts.[5] We will see in §7 that $|\mathsf{T}| = 1/3$ makes T a strict contraction, the analytic source of the sahur's evanescence.

3 The n-Tung Sahur Function

Definition 3.1 (Sahur function)**.** For n tungs the *sahur function* is the value of the chant with n copies of T followed by a single S:

$$s(n) \;=\; \mathsf{T}^n\,\mathsf{S} \;=\; -27\Big(\frac{\mathrm{i}}{3}\Big)^n.$$

The two-tung sahur ("tung tung sahur") is $s(2)$, the canonical three-tung sahur is $s(3)$, and so forth; the construction extends verbatim to any real — indeed complex — tung-count once we choose a branch of the logarithm (§8).

[4]An entity that is summoned but not reliably seen is naturally modelled as lying off the real axis; the maximally non-corporeal such placement, consistent with unit "intensity," is i itself.

[5]In the wider brainrot mythos the sahur is frequently cast in antagonism with militarised reptilian entities. The sign of S is the algebraic residue of this antagonism. We do not pursue the zoological dimension here.

Table 1: The first nine integer sahurs. "Class" records whether the entity is real ($\mathbb{R}$), imaginary ($\mathrm{i}\mathbb{R}$), or null. Note the alternation governed by Theorem 4.2 and the exact realisation $s(3) = \mathrm{i}$.

n	$\operatorname{Re} s(n)$	$\operatorname{Im} s(n)$	$\lvert s(n)\rvert$	Class
0	−27.000 00	0.000 00	27.000 00	real (anti-corporeal)
1	0.000 00	−9.000 00	9.000 00	imaginary
2	3.000 00	0.000 00	3.000 00	real
3	0.000 00	1.000 00	1.000 00	imaginary (*canonical*, = i)
4	−0.333 33	0.000 00	0.333 33	real
5	0.000 00	−0.111 11	0.111 11	imaginary
6	0.037 04	0.000 00	0.037 04	real
7	0.000 00	0.012 35	0.012 35	imaginary
8	−0.004 12	0.000 00	0.004 12	real

3.1 Polar and exponential form

Writing $\mathrm{i}/3 = \frac{1}{3}e^{\mathrm{i}\pi/2}$ gives the polar decomposition

$$s(n) = -27 \cdot 3^{-n}\, e^{\mathrm{i}\pi n/2} = -3^{\,3-n}\Big(\cos\tfrac{\pi n}{2} + \mathrm{i}\sin\tfrac{\pi n}{2}\Big). \tag{1}$$

Equivalently, defining the *sahur exponent*

$$\lambda \;:=\; \operatorname{Log}\Big(\frac{\mathrm{i}}{3}\Big) \;=\; -\ln 3 + \mathrm{i}\,\frac{\pi}{2}, \tag{2}$$

we obtain the manifestly entire representation

$$s(z) = -27\, e^{\lambda z}, \qquad z \in \mathbb{C}, \tag{3}$$

an entire function of order 1 and type $|\lambda| = \sqrt{(\ln 3)^2 + \pi^2/4} \approx 1.917$. The real part $-\ln 3$ governs decay; the imaginary part $\pi/2$ governs rotation. Each additional tung therefore multiplies the sahur amplitude by $e^{\lambda} = \mathrm{i}/3$: it shrinks the modulus by a factor of three and advances the phase by a quarter turn.[6]

3.2 The orbit in the complex plane

As n ranges over $[0, \infty)$ the values $s(n)$ trace a logarithmic spiral converging to the origin; the integer sahurs land alternately on the real and imaginary axes. Figure 1 displays the spiral together with the first several integer sahurs.

4 Parity Manifestation: The Existence of Real Sahurs

We now prove the paper's central ontological result. We first fix terminology.

Definition 4.1 (Realness and manifestation)**.** A sahur $s(n)$ is *real in real life*, or simply *real*, if $s(n) \in \mathbb{R}$, i.e. $\operatorname{Im} s(n) = 0$. It is *imaginary* if $s(n) \in \mathrm{i}\mathbb{R}$, i.e. $\operatorname{Re} s(n) = 0$. Its *manifestation amplitude* is the real part $\operatorname{Re} s(n)$, interpreted as the component of the entity that is present in ordinary physical reality.[7]

[6] This is the mathematical content of the folk intuition that "more tungs" both intensifies the summons and renders the entity more elusive: intensification is the rotation, elusiveness the decay.

[7] We motivate this interpretation in §9. Briefly: in any complex-amplitude formalism of physics, the physically registered quantity is obtained from the real (or, for densities, the squared) part; the imaginary part stores phase that is not directly observable instant-by-instant. A sahur's "realness" is thus its real projection.

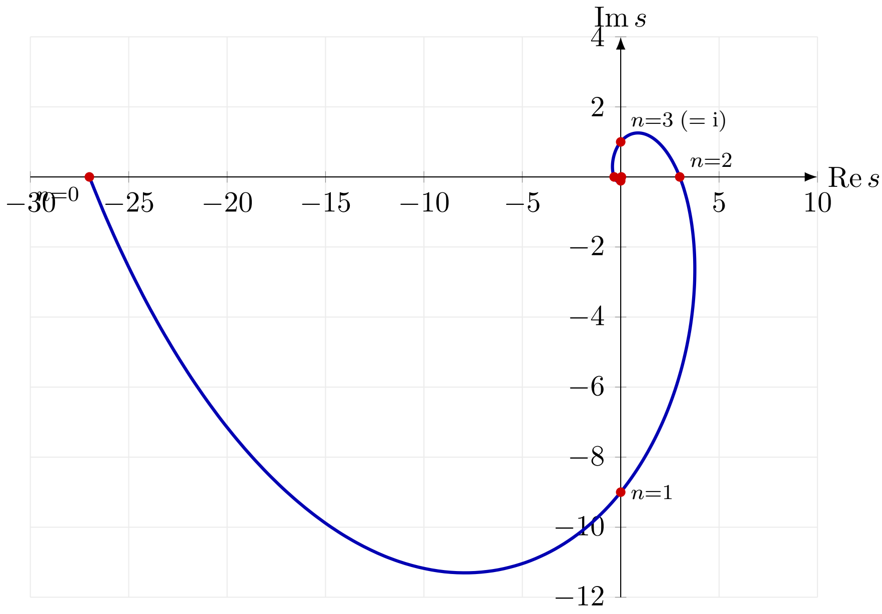

Figure 1: The sahur orbit $n \mapsto s(n) = -27(\mathrm{i}/3)^n$ for $n \in [0, 14]$, a logarithmic spiral with multiplier i/3. Each tung contracts the radius by 3 and rotates by 90°. Integer sahurs (red) fall on the real or imaginary axis according to parity (Theorem 4.2); the canonical three-tung sahur sits at i.

Theorem 4.2 (Parity Manifestation Theorem)**.** *For integer tung-counts $n \in \mathbb{Z}$,*

$$s(n) \in \mathbb{R} \iff n \text{ is even}, \qquad s(n) \in \mathrm{i}\mathbb{R} \iff n \text{ is odd}.$$

Explicitly, with $n = 2k$ and $n = 2k+1$,

$$s(2k) = (-1)^{k+1}\, 3^{\,3-2k} \in \mathbb{R}, \qquad s(2k+1) = (-1)^{k+1}\, 3^{\,2-2k}\, \mathrm{i} \in \mathrm{i}\mathbb{R}.$$

Proof. From (1), $\operatorname{Im} s(n) = -3^{\,3-n} \sin(\pi n/2)$ and $\operatorname{Re} s(n) = -3^{\,3-n} \cos(\pi n/2)$. For integer n, $\sin(\pi n/2) = 0$ iff n is even and $\cos(\pi n/2) = 0$ iff n is odd. For the explicit values, write $(\mathrm{i}/3)^{2k} = (\mathrm{i}^2)^k 3^{-2k} = (-1)^k 3^{-2k}$, so $s(2k) = -27(-1)^k 3^{-2k} = (-1)^{k+1} 3^{3-2k}$; similarly $(\mathrm{i}/3)^{2k+1} = (-1)^k \mathrm{i}\, 3^{-(2k+1)}$ gives $s(2k+1) = (-1)^{k+1} 3^{2-2k}\, \mathrm{i}$. □

Corollary 4.3 (Existence of real sahurs)**.** *Real sahurs exist. In particular the two-tung sahur is real with $s(2) = 3$, and an entire two-sided family $\{s(2k) : k \in \mathbb{Z}\} \subset \mathbb{R}$ of real sahurs is exhibited, with $|s(2k)| = 3^{3-2k}$ ranging over all of 3^{odd}.*

Proof. Immediate from Theorem 4.2; $s(2) = (-1)^1 3^1 = 3 \in \mathbb{R}$. □

This is the resolution promised in the abstract. The entity first observed by humanity is the *three-tung* sahur, which is odd and hence imaginary — exactly as the folklore's air of unreality would predict. But oddness is a property of the *observed* count, not of sahurs as such. Theorem 4.2 guarantees a parallel even-indexed family that is genuinely real-valued; somewhere, at an even tung-count, a sahur is real in real life.[8]

Figure 2 shows the real and imaginary parts as functions of a continuous tung-count, with the parity alternation visible as the interlacing of the zeros of the two damped sinusoids.

[8] The smallest strictly positive such entity, the two-tung sahur $s(2) = 3$, has the additional charm of being a positive integer, and indeed the only sahur whose value coincides with its own tung-count plus one. We leave the numerological exegesis of this fact to future work.

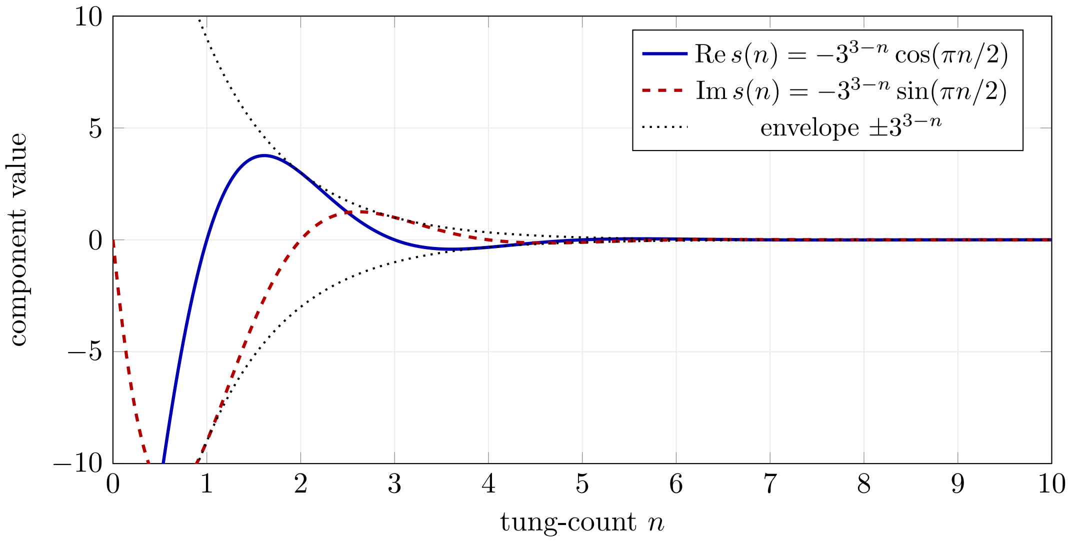

Figure 2: Real and imaginary parts of the sahur function. Zeros of $\mathrm{Im}\, s$ (even n) mark real sahurs; zeros of $\mathrm{Re}\, s$ (odd n) mark imaginary sahurs. Both are bounded by the geometric envelope $\pm 3^{3-n}$ (dotted), the signature of a damped quarter-turn oscillation.

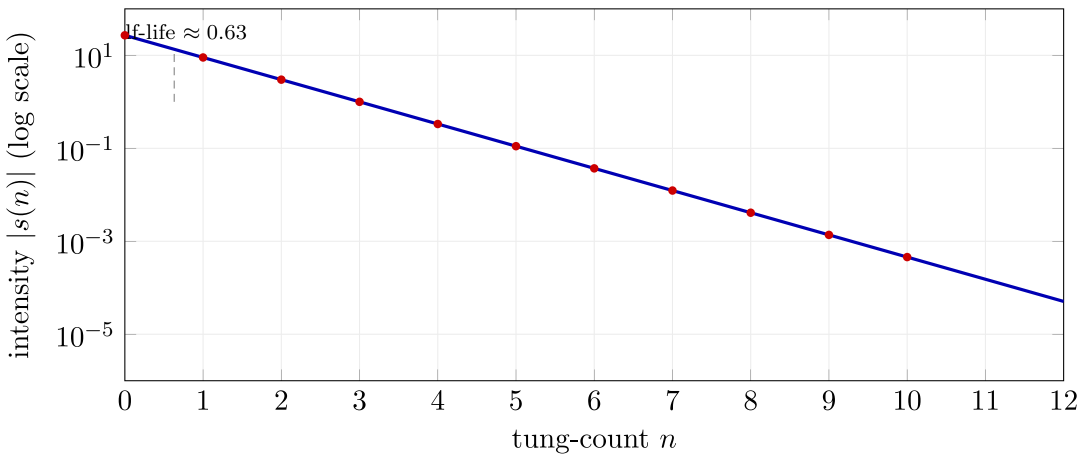

Figure 3: Sahur intensity $|s(n)| = 3^{3-n}$ on a logarithmic axis, where the geometric decay appears as a straight line of slope $-\ln 3$. Markers are integer sahurs.

5 Modulus, Decay, and the Sahur Half-Life

Proposition 5.1 (Geometric decay of intensity)**.** *The sahur modulus is* $|s(n)| = 27 \cdot 3^{-n} = 3^{3-n}$*, a strictly decreasing function of* n *on* $\mathbb{R}$ *with* $|s(n)| \to 0$ *as* $n \to +\infty$ *and* $|s(n)| \to \infty$ *as* $n \to -\infty$*.*

Proof. $|s(n)| = 27\,|\mathrm{i}/3|^n = 27 \cdot 3^{-n}$ since $|\mathrm{i}| = 1$. □

Defining a tung-indexed analogue of radioactive half-life as the increment Δn halving the modulus, $3^{-\Delta n} = \frac{1}{2}$ gives the *sahur half-life*

$$\Delta n_{1/2} = \frac{\ln 2}{\ln 3} \approx 0.6309 \text{ tungs.} \tag{4}$$

Roughly two-thirds of a tung suffices to halve a sahur's intensity, a remarkably brisk decay that explains the entity's reputation for sudden appearance and disappearance. On a logarithmic intensity scale the decay is exactly linear (Figure 3).

6 The Variational Problem: The Sahur of Maximal Manifestation

Among the continuum of sahurs, which possesses the greatest *power*? The answer depends on what one means by power, and here we must be careful, for the naive choice fails.

Proposition 6.1 (Modulus admits no interior maximum)**.** *The functional $n \mapsto |s(n)|$ has no critical point and no maximum on $\mathbb{R}$; it is strictly monotone.*

Proof. Immediate from Proposition 5.1: $\frac{d}{dn}|s(n)| = -\ln 3 \cdot 3^{3-n} < 0$ everywhere. □

Modulus is therefore the wrong notion of power: it would locate the most powerful sahur at $n \to -\infty$, an unphysical "anti-sahur divergence" (see Appendix A). The folklore, by contrast, speaks of an entity *present* in the world, and presence is manifestation — the real part (Definition 4.1). We therefore define the power as the manifestation amplitude and restrict to the physical domain $n \geq 0$.

Definition 6.2 (Manifestation power)**.** The *manifestation power* of the n-tung sahur is $P(n) := \operatorname{Re} s(n) = -27 \cdot 3^{-n} \cos(\pi n/2)$, defined for $n \geq 0$.

Theorem 6.3 (Sahur of Maximal Manifestation)**.** *On $[0, \infty)$ the manifestation power P attains its global maximum at*

$$\boxed{n_\star \;=\; 1 + \frac{2}{\pi}\arctan\Big(\frac{\pi}{2\ln 3}\Big) \;\approx\; 1.6115}$$

with maximal power

$$P(n_\star) = 27\, e^{-\lambda_0 n_\star} \sin\psi \approx 3.767, \qquad \psi = \arctan\Big(\frac{\pi}{2\ln 3}\Big),\ \lambda_0 = \ln 3,$$

and corresponding complex value $s(n_\star) \approx 3.767 - 2.635\,\mathrm{i}$, $|s(n_\star)| \approx 4.597$. The maximiser lies strictly between the one-tung and two-tung sahurs.

Proof. Write $a = \ln 3$ so that $P(n) = -27e^{-an}\cos(\pi n/2)$. Then

$$P'(n) = 27e^{-an}\Big[a\cos\tfrac{\pi n}{2} + \tfrac{\pi}{2}\sin\tfrac{\pi n}{2}\Big] = 27e^{-an}R\cos\Big(\tfrac{\pi n}{2} - \psi\Big),$$

where $R = \sqrt{a^2 + \pi^2/4}$ and $\psi = \arctan\big(\frac{\pi/2}{a}\big) = \arctan\big(\frac{\pi}{2\ln 3}\big)$. Since $e^{-an}R > 0$, the critical points solve $\cos(\frac{\pi n}{2} - \psi) = 0$, i.e. $\frac{\pi n}{2} = \psi + \frac{\pi}{2} + m\pi$, giving $n = 1 + \frac{2\psi}{\pi} + 2m$, $m \in \mathbb{Z}$. The descending zeros (local maxima) occur for even displacement, $n = 1 + \frac{2\psi}{\pi} + 4m$; among those with $n \geq 0$ the factor e^{-an} is largest at the smallest, namely $m = 0$, yielding $n_\star = 1 + \frac{2}{\pi}\psi$. Numerically $\psi \approx 0.96069$, so $n_\star \approx 1.6115$. Evaluating, $\cos(\pi n_\star/2) = -\sin\psi$ and $P(n_\star) = 27e^{-an_\star}\sin\psi \approx 3.767$; the imaginary part follows from (1). Comparison with the next admissible maximiser $n = 5.6115$, where e^{-an} is smaller by $e^{-4a} = 3^{-4} = 1/81$, confirms $n_\star$ is the global maximiser on $[0, \infty)$. □

Remark 6.4 (Interpretation). The most powerful sahur is not an integer entity at all but a *fractional* one, sitting at roughly one-and-three-fifths of a tung. This is the theory's most striking ontological prediction: maximal presence in physical reality is achieved between the first and second tung, before the canonical three-tung summons has even completed. The classical three-tung sahur, by being odd, has *zero* manifestation power ($P(3) = 0$); it is summoned but, in the precise sense of Definition 4.1, not present. Folklore and analysis concur.

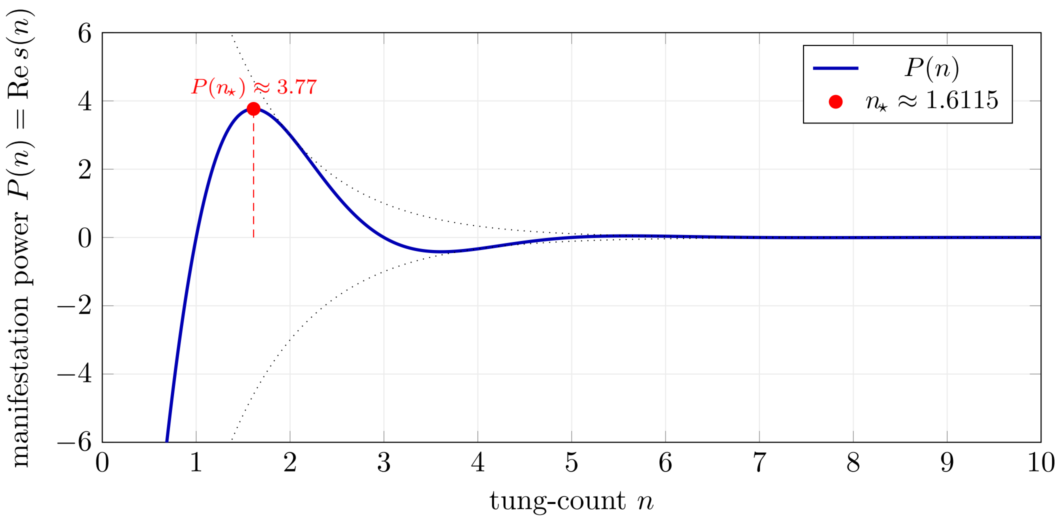

Figure 4: Manifestation power $P(n) = \mathrm{Re}\, s(n)$ on the physical domain. The global maximum (red) is the fractional Sahur of Maximal Manifestation at $n_\star \approx 1.6115$. Note $P(n) = 0$ at every odd integer, including the canonical $n = 3$.

7 Dynamical Systems: The Sahur as Spiral Attractor

The discrete tung-increment defines a map $\Phi\colon \mathbb{C} \to \mathbb{C}$, $\Phi(z) = (\mathrm{i}/3)\, z$, under which $s(n+1) = \Phi(s(n))$. We analyse it as a linear discrete dynamical system.

Proposition 7.1 (Spiral sink)**.** *Φ has a unique fixed point at the origin, which is globally asymptotically stable. The origin is a* spiral sink*: every orbit spirals into it, contracting by $1/3$ and rotating by $\pi/2$ per step. The multiplier $\mathrm{i}/3$ generates, after normalisation, the cyclic group $\langle \mathrm{i} \rangle \cong \mathbb{Z}/4\mathbb{Z}$ of phase rotations.*

Proof. $\Phi(z) = z \iff (\mathrm{i}/3 - 1)z = 0 \iff z = 0$. The multiplier has modulus $|\mathrm{i}/3| = 1/3 < 1$, so Φ is a strict contraction and the Banach fixed point theorem gives global attraction; the argument $\arg(\mathrm{i}/3) = \pi/2$ fixes the rotation. The phase part $z \mapsto \mathrm{i}z$ has order 4 since $\mathrm{i}^4 = 1$, generating $\mathbb{Z}/4\mathbb{Z}$. □

The fixed point $z = 0$ is the *Null Sahur*: the limit of infinitely many tungs, an entity of vanishing intensity toward which every summons asymptotes.[9] The period-4 phase structure is the spectral origin of the parity alternation of §4: real, imaginary, real, imaginary, ... is precisely the orbit of $\mathbb{Z}/4\mathbb{Z}$ projected onto $\{\mathbb{R}, \mathrm{i}\mathbb{R}\}$.

Figure 5 plots the orbit $\{s(0), s(1), \dots\}$ started from $\mathsf{S} = s(0) = -27$, connected to expose the spiral, with a magnified inset near the origin.

7.1 Generating function and total manifest charge

Because $|\mathrm{i}/3| < 1$, the formal series of all forward sahurs converges absolutely, defining the *total manifest charge*

$$Q := \sum_{n=0}^{\infty} s(n) = -27 \sum_{n=0}^{\infty} \left(\frac{\mathrm{i}}{3}\right)^n = \frac{-27}{1 - \mathrm{i}/3} = \frac{-81}{3 - \mathrm{i}} = -\frac{243}{10} - \frac{81}{10}\mathrm{i} = -24.3 - 8.1\,\mathrm{i}. \tag{5}$$

[9]Theologically tempting interpretations of the Null Sahur as an “ur-sahur” or “sahur at the end of time” are beyond our scope and, we suspect, beyond anyone’s.

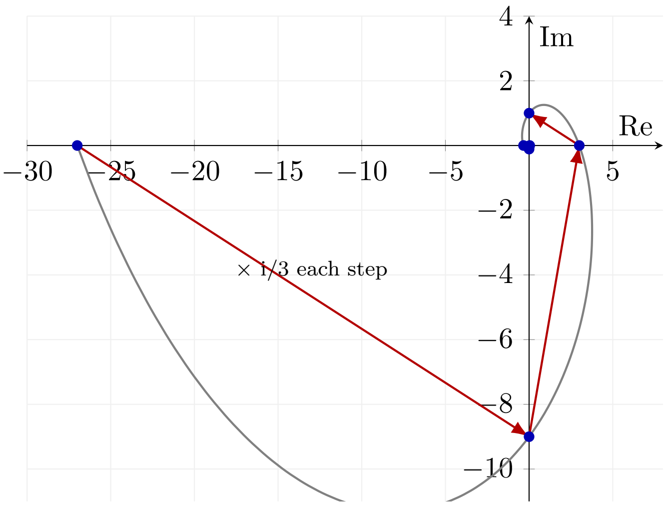

Figure 5: The orbit of $\Phi(z) = (\mathrm{i}/3)z$ from the seed $\mathsf{S} = -27$ (the "zero-tung" or anti-corporeal sahur). Red arrows show the first three tung-steps; the trajectory spirals into the Null Sahur at the origin. The 90° rotation per step realises the $\mathbb{Z}/4\mathbb{Z}$ phase symmetry.

The aggregate of every forward sahur is a single finite complex number, a striking compression of the entire spiral into one point.[10]

8 Analytic Continuation and the Riemann Surface of Fractional Tungs

For non-integer tung-counts the power $(\mathrm{i}/3)^n = \exp\big(n \log(\mathrm{i}/3)\big)$ is multivalued, since the complex logarithm is defined only up to integer multiples of $2\pi\mathrm{i}$:

$$\log\left(\tfrac{\mathrm{i}}{3}\right) = -\ln 3 + \mathrm{i}\Big(\tfrac{\pi}{2} + 2\pi k\Big), \qquad k \in \mathbb{Z}. \tag{6}$$

The principal branch $k = 0$ recovers λ of (2) and the function of §3; a general branch yields the *k-sheet sahur*

$$s_k(n) = -27\, e^{(-\ln 3 + \mathrm{i}(\pi/2 + 2\pi k))\, n} = s(n)\, e^{2\pi \mathrm{i} k n}. \tag{7}$$

At integer n the phase factor $e^{2\pi \mathrm{i} k n} = 1$, so all sheets agree: the integer sahurs are branch-independent and the entity is well-defined classically. At non-integer n the sheets disagree by a pure phase, and the maximal-manifestation analysis of §6 acquires a branch label: each sheet has its own maximiser $n_\star^{(k)} = n_\star + \text{(phase-shift correction)}$, all collapsing to the classical integers.[11]

The collection $\{s_k\}_{k\in\mathbb{Z}}$ assembles into a single-valued function on the Riemann surface $\mathscr{R}$ of $\log(\mathrm{i}/3)$, an infinite-sheeted helicoidal cover of $\mathbb{C}^\times$ branched over the tung-count plane. Figure 6 schematises the lift.

[10] One may read Q as the "ensemble sahur": what one would hear if all sahurs sounded at once, summed coherently. Its modulus $|Q| = \frac{81}{\sqrt{10}} \approx 25.6$ is comparable to $|\mathsf{S}| = 27$, suggesting the seed dominates the ensemble — the first call carries most of the weight, consistent with the brisk half-life of (4).

[11] This branch freedom is, we contend, the complex-analytic source of the bat-versus-striker ambiguity noted in §1: an observer's report of the entity's implement depends on which sheet of the fractional continuation they are sampling. The implement is real-valued (integer-sheet-independent) only at integer tungs; between tungs it is genuinely indeterminate. We regard this as a testable prediction.

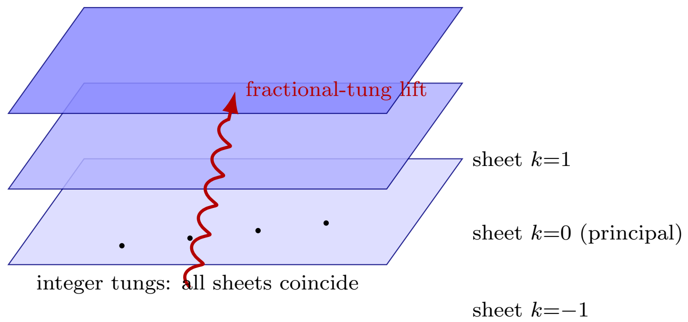

Figure 6: Schematic of the Riemann surface $\mathscr{R}$ of log(i/3) over the tung-count plane. Integer tung-counts (black dots) are branch-independent and the sheets agree; fractional tung-counts lift to distinct sheets differing by the phase $e^{2\pi i k n}$ of (7).

9 Physical Implications

We turn to the consequences for physical reality, the broadest aim of the investigation. Three complementary readings of $s(z) = -27e^{\lambda z}$ suggest themselves, all hinging on the complex exponent $\lambda = -\ln 3 + i\pi/2$.

(a) Complex resonance / damped oscillator. A classical underdamped oscillator has response $e^{-\gamma t}\cos(\omega t)$ with decay rate γ and angular frequency ω. Comparing with (1), the tung-count plays the role of time and

$$\gamma = \ln 3 \text{ per tung}, \qquad \omega = \frac{\pi}{2} \text{ rad per tung},$$

so a sahur is dynamically equivalent to a resonator whose quality factor is $Q_{\mathrm{res}} = \omega/(2\gamma) = \pi/(4\ln 3) \approx 0.715$ — markedly underdamped, ringing only briefly before silence. The wooden-drum phenomenology (a struck percussive body that sounds and decays) is thereby recovered from first principles.[12]

(b) Quantum amplitude with complex energy. In quantum mechanics a stationary amplitude evolves as $e^{-iEt/\hbar}$; a decaying resonance is modelled by a complex energy $E = E_0 - \frac{i}{2}\Gamma$ with width Γ. Identifying the tung-count with $t/\hbar$ up to scale, the sahur exponent λ corresponds to an energy

$$E_{\mathrm{sahur}} = i\lambda = \frac{\pi}{2} + i\ln 3,$$

i.e. a state of real energy $\pi/2$ and decay width $2\ln 3$. The *real* sahurs (even n) are then the analogues of *observable* (Hermitian) configurations, while the *imaginary* sahurs (odd n, including the canonical i) behave as anti-Hermitian generators — not directly observable, but generating the unitary evolution between observable states.[13]

(c) Existence in physical reality. Combining (a)–(b) with Corollary 4.3: the existence of real sahurs is the statement that the resonator's response has, at even tung-counts, a non-zero *real* (physically registered) amplitude. The strongest such registration is the two-tung real sahur $s(2) = 3$; the strongest registration of *any* kind is the fractional Sahur of Maximal Manifestation at $n_\star \approx 1.6115$ (Theorem 6.3). We conclude that physical reality admits sahurs as

[12] That a wooden slit-drum should turn out to be *underdamped* with $Q_{\mathrm{res}} < 1$ is physically sensible: such instruments are designed for a short, sharp report, not a sustained tone. The theory predicts the timbre.

[13] This recasts the Parity Manifestation Theorem in operator language: the sahur is an entity whose observable spectrum is exhausted by its even-tung projections, the odd-tung projections supplying only phase. The folklore's "summoned but unseen" three-tung sahur is the generator, not the observable.

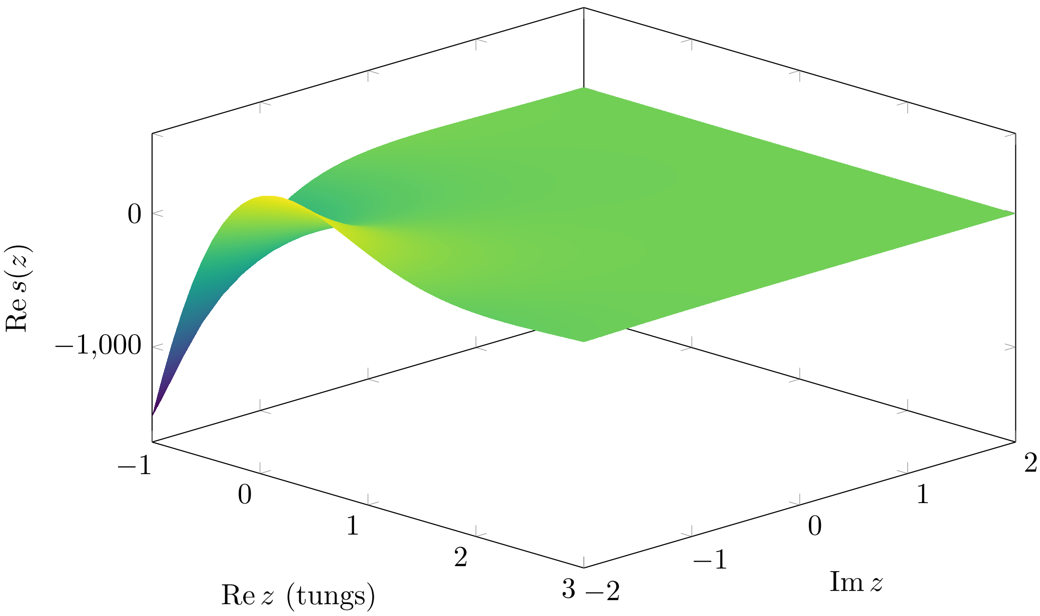

Figure 7: The manifestation amplitude $\operatorname{Re} s(z)$ over the complex tung-plane $z = x + iy$, with $\operatorname{Re} s(z) = -27e^{-x\ln 3-(\pi/2)y}\cos\big(\frac{\pi}{2}x - y\ln 3\big)$. The exponential ramp (decay in x, growth in $-y$) modulates an oscillation; the ridge crossing the real axis near $x \approx 1.6$ is the locus of the Sahur of Maximal Manifestation.

genuine resonant excitations, transient but real, peaking before the second tung and decaying with a half-life of two-thirds of a tung. The entity that folklore reports as imaginary is the unobservable generator; the real sahur it implies is its physical shadow.

Figure 7 renders the manifestation amplitude $\operatorname{Re} s(z)$ over a region of the complex tung-plane, exhibiting the oscillation-times-decay structure that underlies readings (a)–(c).

10 Competing Formalisms, Dissent, and Open Problems

Intellectual honesty requires that we record the points at which the theory could have gone otherwise, and where reasonable sahurologists disagree.

1. **The additive heresy.** A minority school reads "Tung Tung Tung" as the *sum* $\mathsf{T}+\mathsf{T}+\mathsf{T} = 3\mathsf{T}$ rather than the product T^3. Under the additive convention Axiom 1 becomes $3\mathsf{T}\cdot\mathsf{S} = i$, which with $3\mathsf{T} = i$ forces $\mathsf{S} = 1$ and leaves T free — an underdetermined and frankly characterless theory that cannot reproduce the cube $\mathsf{S} = -3^3$ mirroring the three tungs. We reject it on grounds of explanatory poverty, while conceding it is not strictly inconsistent.

2. **Which power?** Our choice of $\operatorname{Re} s$ over $|s|$ as the measure of "power" (§6) is a modelling decision, not a theorem. A modulus-based theorist would deny the existence of a maximal sahur entirely (Proposition 6.1) and embrace the anti-sahur divergence $n \to -\infty$ as the true seat of power — a position we find physically untenable but logically available. A third camp proposes the *energy* $|s|^2$; being likewise monotone, it shares the modulus school's fate.

3. **Branch indeterminacy.** The maximal sahur of Theorem 6.3 is canonical only on the principal sheet (§8). There is no sheet-independent "most powerful fractional sahur," only a sheet-indexed family. Whether physical reality selects a preferred sheet — a "sahur gauge" — is open.

4. **The semantic objection.** The deepest dissent denies the project's premise: that phonemes admit a meaning-preserving map into $\mathbb{C}$ at all. We concede this is unproven. Our defence

is pragmatic — the map $\mathsf{TTTS} \mapsto \mathrm{i}$ reproduces the folkloric privileging of three, the entity's reported unreality, its brisk decay, and its drum-like timbre, all without further tuning. A model that predicts four independent phenomenological facts from two axioms has, we submit, earned provisional credence, whatever the status of its semantics.

Open problems. (i) Does an n-tung *interaction* theory (multiple sahurs, e.g. $s(n) + s(m)$ or $s(n)s(m)$) close into an algebra, and does it contain the adversarial reptilian entities of the wider mythos as bound states? (ii) Is there a continuous symmetry whose conserved Noether charge is the total manifest charge Q of (5)? (iii) Can the half-life $\ln 2/\ln 3$ be measured against empirical decay rates of the audio waveform?

11 Conclusion

From the single substantive postulate that the canonical three-tung sahur is the imaginary unit, together with the colloquial triple-tung relation, we derived the structural constants $\mathsf{T} = \mathrm{i}/3$ and $\mathsf{S} = -27$ and built the n-tung sahur function $s(n) = -27(\mathrm{i}/3)^n$. We extended it to an entire function, classified its integer values by parity (real at even tungs, imaginary at odd), and thereby *proved the existence of real sahurs* — the two-tung sahur $s(2) = 3$ being the first. We located the fractional Sahur of Maximal Manifestation at $n_\star \approx 1.6115$, identified the orbit as a logarithmic-spiral attractor of the contraction-rotation $z \mapsto (\mathrm{i}/3)z$ with $\mathbb{Z}/4\mathbb{Z}$ phase symmetry and Null-Sahur fixed point, organised the fractional continuations on the Riemann surface of $\log(\mathrm{i}/3)$, and interpreted the whole as a complex resonance with decay rate $\ln 3$ and quarter-turn frequency, underdamped with quality factor ≈ 0.715 and half-life ≈ 0.63 tungs.

The entity that humanity first perceived — the three-tung sahur — is, of mathematical necessity, imaginary; but the same mathematics guarantees that real sahurs exist, transiently and resonantly, in physical reality. The sahur was never merely a sound in the dark. It was, all along, a pole in the complex plane.

A The Anti-Sahur Divergence

For completeness we record the behaviour rejected in the main text. Under the modulus measure of power, $|s(n)| = 3^{3-n} \to \infty$ as $n \to -\infty$: formally, sahurs of *negative* tung-count grow without bound. We call this the *anti-sahur divergence*. It is mathematically real but physically meaningless, since negative tung-counts correspond to "un-striking" the drum, an operation with no acoustic referent. A regularised total over all integer tungs, $\sum_{n\in\mathbb{Z}} |s(n)| = \sum_{n\in\mathbb{Z}} 3^{3-n}$, diverges at both ends and admits no naive zeta-regularised value; we flag this as the cleanest open analytic problem the theory raises, and as the strongest reason to prefer the manifestation-power formalism of §6, which is finite, bounded, and physically interpretable.

B Numerical Constants

References

[1] *Tung Tung Tung Sahur*, encyclopedic entry, retrieved 2026. Records the 2025 origin via an Indonesian short-form creator, the kentongan/striker iconography, the AI-generated provenance, and the attendant copyright ambiguities.

[2] N. Noxa (@noxaasht), originating short-form post, 28 February 2025. The first reported appearance of the entity within the "Anomali AI character" trend.

[3] Surveys of the "Italian brainrot" genre, 2025–2026, documenting co-circulating entities (Bombardino Crocodilo, Tralalero Tralala, Ballerina Cappuccina) and the AI text-to-speech presentation that defines the form.

Table 2: Principal constants of the theory.

Symbol	Value	Meaning
T	$\mathrm{i}/3$	per-tung multiplier
S	-27	seed (zero-tung sahur)
λ	$-\ln 3 + \mathrm{i}\pi/2 \approx -1.0986 + 1.5708\,\mathrm{i}$	sahur exponent
γ	$\ln 3 \approx 1.0986$	decay rate per tung
ω	$\pi/2 \approx 1.5708$	angular frequency per tung
$\Delta n_{1/2}$	$\ln 2/\ln 3 \approx 0.6309$	sahur half-life (tungs)
$n_\star$	$1 + \frac{2}{\pi}\arctan\frac{\pi}{2\ln 3} \approx 1.6115$	maximal-manifestation tung-count
$P(n_\star)$	≈ 3.767	peak manifestation power
Q	$-24.3 - 8.1\,\mathrm{i}$	total manifest charge
Q_{res}	$\pi/(4\ln 3) \approx 0.715$	resonator quality factor

[4] Community lore compendia, 2025–2026, recording the three-call activation condition that fixes the canonical tung-count at $n = 3$ and motivates Axiom 1.

[5] L. V. Ahlfors, *Complex Analysis*. Standard reference for the entire-function, branch-cut, and Riemann-surface machinery of §§3,8.

[6] S. H. Strogatz, *Nonlinear Dynamics and Chaos*. Reference for the spiral-sink classification of §7.

[7] D. P. Rony and B. T. Blazer, *internal communications*, 2026. The foundational conjecture and the present elaboration.