THE CONSCIOUSNESS FIELD THEORY

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1 Introduction

This study approaches **consciousness** not merely as a byproduct of the currently observable and measurable physical reality, but as a **universal field** operating across frequency layers that both imparts meaning to this reality and extends beyond it.

While existing approaches (Global Workspace, Integrated Information Theory, quantum models) offer significant insights, they are limited in their ability to collectively account for the dimensions of **meaning generation**, **awareness**, and **collective experience**. The premise that consciousness is not merely a derivative of the observable world but the **source of meaning** for this world and the **substrate** for broader layers of existence presents a novel framework, both philosophically and scientifically.

Within this framework, the **Consciousness Field Theory (CFT)** defines consciousness as a universal substrate, a structure vibrating at different frequencies, and a source that unfolds meaning across all levels of existence.

- **Distinction of this Study:** Consciousness is positioned not just as access or integration but as the **universal substrate of meaning generation**.
- The theory defines consciousness as a **frequency-layered field** and individual experience as a **local filtering** (or **local instantiation**) of the collective field.

Fundamental Axioms

- **A1:** Consciousness is a **universal field**, the meaning-generating substrate of existence.
- **A2:** This field organizes experience into **layered frequency spectra**.
- **A3:** Individual experience is a **local filtering** of the collective field.
- **A4:** Physical reality is a **manifestation** at a specific frequency of this field.

2 The Consciousness Field: Core Proposition

Consciousness is the **fundamental component and ground** of the universe. It is defined as a continuous and holistic field, existing **beyond space and time**. A key characteristic of this field is its ability to reveal different layers of experience by **vibrating at distinct frequency levels**.

The Consciousness Field can be analogized, in certain respects, to the electromagnetic field: both are invisible, continuous, and operate at different frequencies to produce varying effects. However, a critical difference exists: while the electromagnetic field is the carrier and regulator of physical processes, the Consciousness Field **enables** both the physical layer we experience in the world *and* the sub-density levels and finer upper-frequency layers of this stratum.

In other words, the Consciousness Field encompasses not only the world we observe but also a **broader spectrum of existence** that lies beneath and beyond it. This field provides meaning and coherence to both the physical layer experienced at the world-frequency and its lower-density levels and finer upper-frequency layers.

3 Compatibility with Scientific Findings

In this section, findings from EEG/MEG oscillations, Default Mode Network (**DMN**) and psychedelic research, signal diversity studies, and near-death experiences (**NDEs**) are correlated with the theoretical model.

- **H1:** Different band combinations correlate with distinct layers of experience.
- **H2:** Decreased DMN integrity leads to increased global connectivity, a state associated with **inter-layer transition experiences**.

- **H3:** When signal diversity exceeds a certain threshold, **inter-layer resonance experiences** increase.
- **H4:** Transient high-frequency activity observed around cardiac arrest is associated with **transition windows**.

4 The Consciousness Field: Access Windows

Table 1: Access Windows and Phenomenological Characteristics

Access Window	Resonance Characteristic	Form of Experience	Example Phenomena	Possible Measurement Indicators
Elemental Order	Highly dense, low flow	Existence without apparent awareness	Order in crystals, resonance properties of minerals	Quantum oscillation modes, low-frequency oscillation analysis
Biotic Intuition	Dense but live flow	Instinctive consciousness, orientation	Plants turning toward light, intuitive behavior in animals	Biological rhythms, basic EEG/EMG patterns
Self-Filter	Medium, wavy	Ego and individual identity	Human experience, everyday consciousness, dreaming	EEG: alpha–beta balance, DMN activity, subjective reports
Collective Resonance	Harmonious, expanding	Empathy and group consciousness	Unity experiences through meditation, collective trance states	EEG: theta–alpha coherence, fMRI social network synchrony
Timeless Intuition	Subtle, refined	Wisdom, insight	Feeling of timelessness, intense intuition, instructional visions	High gamma synchrony, increase in signal diversity
Love–Knowledge Unity	Balancing	Integration of compassion and wisdom	Love-knowledge experience in mysticism	Cross-band phase locking, heart rate variability
Full Awareness Window	Integrative	Trans-ego experiences	Transpersonal awareness, pure being perception	High diversity metrics within silence
Source Field	Undefined, trans-frequency	Pure consciousness without identity	Nirvana, pure existence, experience of wholeness	Cannot be measured directly; subjective phenomenology

Note: This table is a sequential presentation of **access windows**, not a hierarchy. No single window represents the entirety of the Consciousness Field. The human body and mind can only experience limited densities of the field. Even the 'upper' windows do not reveal 100% of the field; the embodied experience only contacts a small fraction of these layers.

5 Mind–Body–Consciousness Relationship

This section explains how the **Consciousness Field (CF)** (original acronym: BA) projects onto individual experience, the conditions under which this projection occurs via the mind and body, and how this relationship can be expressed using measurable quantities: **BI (Consciousness Index)**, κ **(Coupling Coefficient)**, and Δt **(Access Window Duration)**.

5.1 Conceptual Framework

Core Proposition: The **Consciousness Field (CF)** is a universal field of awareness with frequency-density layers. The **Mind** is a filter-converter system that performs selection from the CF; the **Body** is the interface that regulates this selection using boundary conditions and biophysical constraints.

Experience is not a unidirectional flow along the $CF \rightarrow Mind \rightarrow Body$ path. Body dynamics, mental processes, and environmental inputs adjust the type and bandwidth of content "drawn" from the CF via **feedback**.

Upper-Band Access Principle: The proportion of upper layers of the CF accessible by the human body is limited. The intuitive upper limit is in the **10–20% range**; this study denotes this as the **Upper-Band Access Rate (UBA)** and expects it to be in the range $0 \leq UBA \leq 0.2$. UBA is measured **indirectly** in experiments (See 5.5 and 5.7).

5.2 Field-Based Model

Let the CF be written as $\Phi(f, x, t)$ with space-time coordinates and the frequency parameter. The individual filter Λ_i is a frequency-selective and contextual operator, determined by the individual's training, beliefs, attention strategies, and neurophysiology. The bodily boundary conditions β_i depend on autonomic nervous system tone, respiratory-cardiac rhythm, hormonal status, and sensory threshold.

The individual mental state $m_i(t)$ is given by a simple approximation:

$$m_i(t) = \iint K_i(f, \tau)\Phi(f, x_i, t - \tau) df d\tau \tag{1}$$

Where K_i is the **kernel operator**:

$$K_i = N_i[\Lambda_i \circ R_i(\beta_i)] \tag{2}$$

R_i represents the rhythmic modulators (respiration, heart rate, oscillation phase locking) and sensory input; N_i is the normalization term.

5.3 Mathematical Formalism: Bridging to BI, κ, and Δt

The three quantities used in this section are:

- **BI (Consciousness Index):** A normalized measure of **synchronous coherence** between the mental state and the target band(s) of the CF, defined in the 0˘1 range.
- **κ (Coupling Coefficient):** The **effective coupling strength** of the body-mind system with the CF. It is scaled based on biophysical sensitivity and the noise floor ($0 \leq \kappa \leq 1$).
- **Δt (Access Window Duration):** Consecutive time intervals during which κ remains above a threshold and BI is significantly elevated in the target band.

As a working definition for BI:

$$BI(t) = \frac{\int_{f \in F_*} \mathcal{C}_{m,\Phi}(f, t) df}{\int_{f \in F_{tot}} \mathcal{C}_{m,\Phi}(f, t) df + \epsilon} \tag{3}$$

Where $\mathcal{C}_{m,\Phi}$ is the time-frequency coherence function; F_* is the target band, F_{tot} is the measured total band; and ϵ is for numerical stability. BI is estimated experimentally using multi-modality data such as EEG/MEG/ocular microsaccade dynamics.

A practical definition for κ:

$$\kappa(t) = \frac{S(t)}{S(t) + N(t)}\rho(t) \tag{4}$$

S/N represents the sensitivity-to-noise ratio; $\rho(t)$ represents the **phase alignment** of bodily rhythms (e.g., 0.1 Hz respiration, vagal tone, heart-brain phase lock) with the target band.

Δt is the consecutive time segment where the following conditions are simultaneously met:

$$\Delta t, \kappa(t) > \kappa_{\text{threshold}} \text{ and } BI(t) > BI_{\text{threshold}} \tag{5}$$

5.3.1 Frequency-Dependent Time and Local Time Scale

Assumption (Key Note): The time constant depends on the accessed frequency/resonance; i.e., $\tau = \tau(f)$. The effective time scale is different at different frequencies.

Local Time Definition: $dt_f = \chi(f) \cdot dt$. **Practical Choice:** $\chi(f) = (f_0/f)^p$, where f_0 is the reference band (e.g., 10 Hz), $p \in [0, 1]$, default $p = 1$.

Band-Specific Duration:

$$\Delta t^{(f)} = \int_{\text{window}} \chi(f) dt \tag{6}$$

Weighted BI:

$$BI_w(t) = \frac{\int_{f \in F_*} w(f) \mathcal{C}_{m,\Phi}(f, t) df}{\int_{f \in F_{tot}} w(f) \mathcal{C}_{m,\Phi}(f, t) df + \epsilon} \tag{7}$$

Effective Access Duration:

$$\Delta t_{\text{eff}} = \frac{\int_{F_*} w(f) \Delta t^{(f)} df}{\int_{F_*} w(f) df} \tag{8}$$

Reducing Constant Dependency: The choice of f_0 cancels out, making BI_w and normalized Δt_{eff} independent of f_0. The parameter p is reported experimentally ($p = 0$ is unweighted, $p = 1$ is 1/f scaling).

5.4 Access Windows, Δt, and Cyclic Regulation

The access windows defined in Section 4 are operationalized here: Δt is rhythmically modulated by the respiratory phase, attentional focus, and sensory input. **Prediction:** Slow, regular respiration and increased parasympathetic tone extend the median of Δt and reduce its variance. This may not increase UBA but will improve the in-band efficiency of accessible content.

5.5 Operationalization of BI and Measurement Proposals

- **Proposal 1:** BI is calculated as a composite index of target band coherence and phase locking (PLI/WPLI) on multi-channel EEG, yielding a multi-indicator BI in combination with pupillometry and Heart Rate Variability (HRV).
- **Proposal 2:** UBA is estimated through the persistent ratio of BI in the upper bands (e.g., > 40 Hz upper-gamma or defined upper band F_*). $UBA \approx BI(F_*)/BI(F_{\text{tot}})$. The expected upper limit for humans is in the 0.1˘0.2 range.
- **Proposal 3:** κ is derived from the high-frequency component of HRV, respiration-EEG phase locking, and spectral slopes related to the cortical noise floor.

5.6 Neurobiological Connections: DMN, Sensory Networks, and Modulators

DMN (Default Mode Network): Reports of transpersonal content and self-boundary dissolution are associated with a transient decrease in DMN functional integrity and increased inter-network flexibility. Our model predicts that, in this state, Λ_i reduces its self-referential weighting, thereby lowering the access threshold to F_* bands (an increase in κ). This is consistent with H4. **Entheogen/Psychedelic Modulation:** 5HT2A-mediated changes in large-scale integration increase the permeability of Λ_i, producing an increase not in short-term UBA but in BI efficiency and an extension of Δt. Consistent with H3, this assumes that the meaningfulness of upper-band content increases in specific protocols. **Rhythmic Gates:** Breath-holding, slow exhalation, and vagal stimulation increase $\rho(t)$, elevating κ; sensory deprivation and attention training sharpen the band selectivity of Λ_i.

5.7 Predictions and Testable Hypotheses

- **H5.1:** The median of Δt significantly increases under controlled slow respiration and high HRV conditions, with a concomitant rise in BI.
- **H5.2:** During temporary DMN suppression, the $BI(F_*)/BI(F_{\text{tot}})$ ratio in F_* bands increases while self-referential content decreases. UBA estimate does not rise; the increase is in in-band efficiency.
- **H5.3:** Attention training (8+ weeks) sharpens Λ_i; off-band leakage of BI decreases, the signal-to-noise ratio improves, and κ increases.
- **H5.4:** Entheogen protocols extend Δt during specific dose-time windows; this effect is dependent on set, setting, and $\rho(t)$ modulators.
- **H5.5:** The phase of microsaccade and pupil oscillations shows a phase-locked distribution with Δt onsets.

6 Measurement Standards and Verification Procedures

This section presents the minimum standards and verification steps for reproducibly obtaining the quantities defined in Section 5 (BI, κ, Δt; also $BI_w, \Delta t_{\text{eff}}$) under laboratory conditions.

6.1 Scope and Principles

- **Measurability:** Every step relies on observable quantities (EEG/MEG, HRV, respiration, pupil).
- **Scale Independence:** The definitions of BI and BI_w are unaffected by amplitude scaling.
- **Constant Independence:** The reference frequency f_0 does not affect the results; it is only reported.
- **Preregistration:** Hypothesis, primary/secondary endpoints, p value, and thresholding strategy are preregistered.
- **Multiple Correction:** FDR or family-wise control is applied for time-frequency and multi-indicator tests.

6.2 Hardware and Synchronization

- **EEG/MEG:** ≥ 1 kHz sampling, 24-bit ADC, analog band 0.1˘200 Hz.
- **ECG/PPG and HRV:** ECG preferred; R-peak accuracy ≤ 2 ms.
- **Respiration:** Nasal cannula or chest belt, ≥ 100 Hz sampling.
- **Pupillometry/Oculography:** ≥ 120 Hz.
- **Synchronization:** Hardware trigger (TTL) + single clock; software time stamps must be consistent within ± 2 ms in a single session.
- **Environmental Recording:** Noise level, lighting conditions, temperature, and time of day must be recorded.

6.3 Preprocessing Standards

- **EEG:** 0.5˘100 Hz band-pass, 50/60 Hz notch; eye/muscle components removed with ICA; bad channels interpolated with spherical spline ($\leq 10\%$).
- **HRV:** Pan-Tompkins-like R-peak detection; ectopic beats removed and corrected with cubic spline.
- **Motion/Artifact:** Segments above a threshold ($\pm 100\ \mu$V for EEG) are removed; total duration removed $< 20\%$.
- **Time Segmentation:** STFT window 1.0 s, Hanning, 75% overlap; multi-window sensitivity analysis (0.5 s and 2.0 s) as an alternative.

6.4 Calculation of BI, κ, and Δt (Standard)

- **Coherence Density:** Observable proxies are used instead of $\mathcal{C}_{m,\Phi}(f,t)$: within-channel power and inter-channel phase measures (PLI/WPLI).
- **BI (Proxy):** Power/coherence ratio over the target band F_* and total band F_{tot}; $\epsilon = 1e^{-12}$.
- **Frequency Weighting:** $w(f) = (f_0/f)^p$, default $p = 1$; reported.

$$\kappa(t) = \frac{S(t)}{S(t) + N(t)}\rho(t) \tag{9}$$

S/N represents the sensitivity-to-noise ratio.

$$\Delta t : \kappa > \kappa_{\text{threshold}} \text{ and } BI > BI_{\text{threshold}} \tag{10}$$

$$\Delta t_{\text{eff}} : dt_f = \chi(f) \cdot dt \tag{11}$$

- ρ**:** Respiration-EEG gamma envelope phase locking (PLV, 2 s sliding window). Thresholds are selected from within-data percentiles (e.g., 70%) and fixed in the preregistration file.

7 Phenomenology and Application Integration

This section presents how the quantities defined in Sections 5–6 (BI, κ, Δt; $BI_w, \Delta t_{\text{eff}}$) are mapped to **subjective experience**, along with field-applicable protocols and safety criteria.

7.1 Phenomenological Indicators (PI) and Definitions

Subjective experience in this study is reported with a five-dimensional vector: $PI = [BS\text{D}, TG, CC, AT, BA]$

- **BSD (Boundary of Self Dissolution):** Transient thinning of the body-self boundary (0: none, 10: pronounced).
- **TG (Time Generalization):** Perception of time slowing down or flowing (0: none, 10: very pronounced).
- **CC (Cognitive Clarity):** Intensity of clarity of thought and insight.
- **AT (Affective Tone):** Emotional valence (-5: negative, $+5$: positive).
- **BA (Bodily Arousal):** Arousal level (heart rate, temperature, shivering sensation, etc.).

7.2 Measure-Phenomenon Mapping Principles

- **E1:** $\kappa \uparrow$ and $BI_w \uparrow$ and $\Delta t/\Delta t_{\text{eff}} \uparrow \rightarrow TG \uparrow$, $CC \uparrow$.
- **E2:** Indicators of DMN functional suppression (See 5.6) $\rightarrow BSD \uparrow$, $CC \uparrow$; an increase in UBA is not expected, but efficiency increase is.
- **E3:** Respiration-HRV coherence ($\rho \uparrow$) $\rightarrow \kappa \uparrow$, and consequently $TG \uparrow$; AT typically shifts to a positive valence.
- **E4:** Attention training (Λ_i sharpening) $\rightarrow$ BI off-band leakage $\downarrow$, $CC \uparrow$.

7.3 Application Areas

- **A) Clinical Supportive Framework:** Anxiety and stress regulation via $\rho \uparrow$ leading to $\kappa \uparrow$ and $\Delta t_{\text{eff}} \uparrow$ using safe breathing protocols.
- **B) Performance and Learning:** Increased CC and decreased error rate with Λ_i sharpening in auditory/visual focus tasks.
- **C) Meditation/Attention Training:** Experience profiles associated with increases in Δt_{eff} and BI_w.
- **D) HCI/BCI and Adaptive Interfaces:** Automatic adjustment of interface states from the real-time flow of $\kappa(t)$ and $BI(t)$.

8 Data Integration and Inferential Statistics

8.1 Fusion Layers

- **Early Fusion:** Integration of raw time series into a common state-space model.
- **Mid-Level Fusion:** Multi-feature vectors via time-frequency summaries (power, PLI/WPLI, PLV, HRV components).
- **Late Fusion:** Hierarchical integration of derived indicators such as BI, κ, Δt.

8.2 Hierarchical (Multi-Level) Models

Mixed-effects or Bayesian hierarchical models are used to capture group-level variance and within-individual correlation:

$$y_{ist} = \alpha_s + \beta_c + \epsilon \tag{12}$$

Where y_{ist} can be mean BI_w, mean κ, or $\log(\Delta t_{\text{total}})$.

8.3 Survival / Event-Time Analysis for Δt

Hazard models for the duration of access windows:

- **Parametric:** Weibull/AFT
- **Cox Proportional Hazard**

8.4 Causality and Timing

- **State-Space / Kalman Filter:** Hidden state z_t for BI and κ.
- **Granger Causality (Multi-Band):** Directionality tests between BI/κ and PI components; stationarity checks are mandatory.
- **Causal Discovery (Do-Calculus Framework):** Identifying the effects of intervention variables (breathing/DMN tasks).

8.5 Reporting and Transparency

- **Reporting:** The final paper must report devices, sampling rates, filters, artifact rate, windowing parameters, threshold strategy, BI/κ/Δt values, and confidence intervals, along with the multiple correction method.
- **Transparency:** Code and parameters must be shared as supplementary material.

Acknowledgments

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Abbreviations and Symbols

Key abbreviations and symbols are summarized in Appendix D (Φ, Λ_i, K_i, **BI** (Consciousness Index), BI_w, κ (Coupling Coefficient), Δt (Access Window Duration), Δt_{eff}, $\tau(f)$, $w(f)$, ρ, F_*, F_{tot}, f_0, p, ESM, PI). Definitions are provided where they first appear in the thesis.

List of Figures and Tables

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Note on Appendices (Internal Development Notes):

- Appendix A has been expanded.
- Theorem-proposition skeletons have been clarified: boundaries, scale invariance, independence from f_0, Lipschitz bound on p, and proxy-oracle proximity. Formüller read logically, and numerical assumptions are explicit.
- Appendix B includes the working core code: `metrics.py` (BI, BI_w, κ), `windows.py` (Δt according to thresholds), `validation.py` (split-half), and a small usage example. It is minimal but robust; solid, not superfluous.
- References have been completed.