Chayut Universe Wave Function

Paper A-19 : Quantum Fields under CUWF

Fields as Entropic Wave Modes, Particles as Collapse Resonances

Title: Chayut Universe Wave Function (CUWF) Paper A-19 Quantum Fields under CUWF : Fields as Entropic Wave Modes, Particles as Collapse Resonances

Author: Chayut Techasamran

Affiliation: Independent Researcher, Thailand

Correspondence: cuwfwave@gmail.com

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Abstract

Quantum Field Theory (QFT) is among the most successful mathematical frameworks in modern physics, yet its ontology remains difficult to interpret. QFT provides field operators, vacuum states, creation and annihilation operators, commutation relations, propagators, vertices, gauge fields, and renormalization procedures with extraordinary predictive power, but it does not by itself explain what a field physically is, why particles emerge as stable identities, why vacuum is non-empty, or why infinities appear when the formalism is extended to arbitrary scale.

This paper develops the CUWF interpretation of quantum fields. In the CUWF framework, a field is not a primitive spacetime entity. It is an entropically admissible ensemble of wave modes in mode space. A particle is not a point-object or an independent substance, but a collapse-stabilized standing resonance within that field. Vacuum is not nothing; it is the baseline entropic mode sea. Interactions are not point-collisions between primitive particles, but entropic coupling and resonance reconfiguration among mode families.

The paper constructs a mode-space formalism involving entropic wave fields, amplitude-phase modes, entropic curvature, weighted mode density, entropic action, entropic Laplacian propagation, collapse-stabilization criteria, and resonance invariants. It then reinterprets standard QFT structures as effective projections of deeper CUWF mode dynamics: the field operator $\phi(x)$ becomes a spacetime projection of mode amplitudes; creation and annihilation operators become resonance-formation and resonance-dissolution operations; commutation relations become projected algebraic consequences of mode indistinguishability, phase-coherence rules, and entropic compatibility; gauge fields become phase-alignment connections; gauge bosons become mediator resonances of phase correction; and Feynman diagrams become bookkeeping systems for resonance transition pathways.

Renormalization is interpreted as an approximation artifact arising when QFT treats a projected field continuum as fundamental, without retaining the natural entropic cutoff and finite wave-structure resolution of the underlying mode space. In this view, QFT is not rejected; it is recovered as the quasi-linear, weak-curvature, stable-vacuum limit of CUWF. The paper concludes by identifying domains where CUWF corrections may become relevant, including early-universe field behavior, black hole vicinities, high-energy scattering anomalies, and vacuum fluctuation correlation tests. Paper A-19 therefore serves as the CUWF bridge between quantum field formalism and a deeper wave-entropic ontology.

Keywords

CUWF; Chayut Universe Wave Function; quantum fields; entropic wave modes; collapse resonance; mode space; quantum vacuum; zero-point energy; vacuum polarization; gauge symmetry; gauge boson; Feynman diagrams; renormalization; entropic cutoff; QFT approximation; resonance ontology; field-particle duality; measurement problem; entropic curvature; effective field theory

