

The Restoring and Replacing in the Universe: Tribute to Bulnes's Quantum Ground Operator

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Abstract

The purpose of the present paper is to share and explain an innovative proposal of the Mexican mathematician Dr. Francisco Bulnes, who posits the existence of a fundamental quantum operator: a kind of "invisible floor" that supports and guides every transformation in the universe. This operator the replacing and restoring of a quantum system considering the correction or restoring of some anomalous states where these can be result of perturbations, existence of enery loads scattering or simply an anomalous state of energy due to an interaction between particles and anti-particles. Also is developed a numerical simulation on the recovering and restoring of a quantum system eliminating anomalous enery states.

Introduction

Understanding the energy structure of the universe is one of the greatest challenges in contemporary physics. Modern cosmological observations reveal that visible matter accounts for only a small fraction of the cosmos's total energy content, while the majority is associated with components that are not yet fully understood—such as dark matter, dark energy, and the fundamental fields governing spacetime dynamics.

In this context, the "Quantum Ground Operator" proposal, developed by Dr. Francisco Bulnes, introduces a geometric and functional formulation designed to describe the energy organization of physical fields using differential operators defined on spacetime manifolds.

This article analyzes the cosmological interpretation of said operator and its potential application to constructing an energy map of the observable universe, represented as a compact, measurable region of spacetime. It examines the relationship between field theory, differential geometry, and the spectral structure of energy, proposing a unified view in which the cosmic energy distribution emerges as a consequence of geometric transformations induced by fundamental operators.

From Einstein's pioneering work on general relativity to modern formulations of quantum field theory, physics has sought to

understand how energy is distributed and evolves within the universe.

Observations made using optical telescopes, radio telescopes, and cosmological satellites show that matter is not uniformly distributed. Instead, the universe exhibits a complex network of hierarchical structures—comprising galaxy clusters, superclusters, cosmic filaments, and vast voids.

This spatial organization, known as the cosmic web, suggests the existence of profound geometric principles governing the evolution of energy and fundamental fields.

The proposal presented by Dr. Bulnes in **A Quantum Ground Operator in Field Theory** (Q-GOFT Bulnes) [1-3] introduces a fundamental operator capable of describing the conservation and propagation of energy within dynamical systems defined on differentiable manifolds. From this perspective, the observable universe can be interpreted as a compact region of spacetime whose energy structure emerges from the action of said operator on physical fields.

Following this discovery, science ceased to view nature as an unbroken flow and began to understand it as a structure composed of "instants" and "packets" of energy.

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Against this backdrop, innovative proposals are emerging—such as that of Mexican mathematician Dr. Francisco Bulnes, who posits the existence of a fundamental quantum operator: a kind of "invisible floor" that supports and guides every transformation in the universe.

This article does not aim to decipher equations, but rather to open a window of understanding for those without a scientific background who wish to grasp the profound significance of these ideas.

These conjectures seek to deepen the relationship between resonance, informational memory, self-organization and universal coherence. This paper will be centered in self-organization of a quantum system where the energy conservation law stills satisfying the equilibrium of energy in the deepest level of the Universe.

The purpose of the present work is to share with the reader a new line of research centered upon the replacing and restoring of a quantum system considering the correction or restoring of some anomalous states where these can be the result of perturbations, existence of energy loads scattering or simply an anomalous state of energy due to an interaction between particles and anti-particles.

In the deep quantum zone, the anomalous states can be replaced for good states, satisfying the conservation principle of energy? The answer is yes, in deep quantum frameworks, "anomalous" states can transition into stable "good" states while fully satisfying the conservation of energy. In quantum mechanics, what appear to be anomalies or temporary deviations from classical laws are actually natural consequences of the system's mathematics, governed strictly by the Heisenberg Uncertainty Principle and unitary evolution.

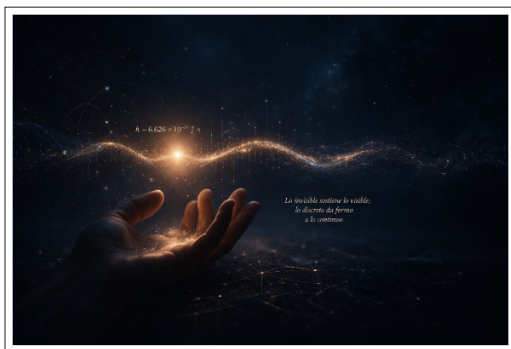


Figure 1: Restoring and replacing of the quantum energy states in the deepest of the Universe [4].

For other way, we can question us: could be planted a quantum transform that replace anomalous states by good states using the Bulnes's quantum ground operator [3, 5].

The answer is yes, from a theoretical standpoint within field theory, you can formally structure an inverse problem or quantum transform using Bulnes's quantum ground operator O_c to map highly entropic, anomalous states back into stable, energy-minimizing "good" states.

In standard quantum computing, correcting states relies on discrete error-correcting codes. However, in the continuous geometric and topological framework proposed by Bulnes, the "quantum ground operator" acts as a fundamental stabilizer.

Then the transitions to replace anomalous states by "good" states occur without violating the fundamental principle of energy conservation. Through an operator called ground operator [cite], which can replace anomalous states by good states of energy, satisfying the energy conservation principle, can be realized these transitions, at least in the instant of the evolution of a quantum system.

In the next section, is showed such a transform quantum energy states under this mathematical framework.

Defining the Ground Operator as an Energy Minimizer

In Bulnes's framework, the quantum ground operator O_c is an operator underlying field actions that preserves the energy state of a system and strictly maintains the conservation laws of the Lagrangian.

The Analogy: Bulnes describes the operator's stabilizing function as analogous to "placing a slab on a floor," where the energy state is securely nested into a "hole" of a Hamiltonian manifold to prevent decay or unwanted fluctuations. The mathematical constraint: The energy E , invested in stabilizing or conducting the space-time path obeys the relation (Bulnes's principle conservation of quantum ground [2,3].

$$E = \mathcal{J}_{O_c} - O_c \quad (1)$$

where $\mathcal{J}_{O_c}$ represents an integrated field action over a localized quantum space.

In the deepest level of the Universe, there are not scattering only replacing of energy states.

Formulating the Transform to Correct Anomalous States

To replace "anomalous states" (which represent high entropy, quantum degradation, singularities, or unwanted dispersions) with "good states" (stable, coherent ground states), the transform is structured as a quantum integral transform over an inverse problem.

Likewise, the inverse problem is determined to this quantum problem considering instead of letting a state evolve forward into chaos, you map the anomalous field state back to its underlying geometric origin.

The transform is formulated using an intentionality integral that integrates the ground operator over the space-time manifold M , and its corresponding fiber bundles [5]:

$$\mathcal{J}(O_c(x(s))) = \int_{Q_x} \int_M L \left(\theta \left(\pi^{-1} \left(\sigma(p^{-1}(x)) \right) \right) \right), \quad (2)$$

By passing the anomalous field state through this transform, the operator strips away the high-entropy "noise". It forces the state variables to align and correct the degradation.

Table 1: Elements of the integral restoring transform [2,6].

Ground Operator (O_c)	Core kernel; enforces energy conservation and stabilizes the manifold
Integral Transform	The mapping vehicle; uses an inverse geometric problem to bypass functional path degradation
Good State	Output; a stabilized, localized energy state resting securely on the Hamiltonian floor

While this approach is highly theoretical and sits primarily within mathematical physics and advanced nanotechnology modeling rather than current commercial quantum computing (like standard gate-based qubits), it provides a rigorous, geometric way to conceptualize macro-scale field stabilization.

This suggests that through a process can be obtained a way to transform anomalous quantum signals in its correct and stable quantum state signal.

We see the following simple example. This example is downloaded from the great work “On a Pair of Quantum Integral Transforms to the Conscience Field” of the Dr. Bulnes [6]. The concept of the quantum integral transform appears as was mentioned in the Table 1, of this same section. We could call these integral transform pair as quantum integral transforms of Bulnes.

Example 3.1: We consider the energy state given by the 1-dimensional wave function of a particle (function of its momentum, time, position, and spin). We consider the system evolutions with zero energy state $|0\rangle^1$. Let the load given by the force $\delta(t-s)$. Then, the conscience field of this particle is affected by this energy load as:

$$\begin{aligned} Q(X(t)) &= \int_{X(C)} O_s(X(t))W^+(t-s)ds = \int_{X(C)} \Psi(X,S)\delta(t-s)ds \\ \int_{X(C)} \Psi(t)\delta(t-s)dt &= \int_{X(C)} Ae^{\alpha t} + Be^{\alpha t}\delta(t-s)dt = \frac{A}{\alpha}e^{\alpha s} + \frac{B}{\alpha}e^{-\alpha s} \end{aligned} \quad (3)$$

where the constant $\alpha = \sqrt{(3m/h)(V_0 - E)}$ and we have produced the signal

$$\star(s) = \frac{A}{\alpha}e^{\alpha s} + \frac{B}{\alpha}e^{-\alpha s}, \quad (4)$$

which is a signal affected in its amplitude by the factor $\left(\frac{1}{\alpha}\right)$, which limits its energy. Now, how we can eliminate this inconvenience? Applying the inverse quantum transform Q^{-1} , where the kernel of the transform is the quantum ground operator which through a restoring correct this inconvenient. Indeed, considering the weight function $w(t,s)=\delta(s-t)$, we have:

$$X(t) = \dim^{\wedge}(\alpha) \int_{X(C)} \left\{ \frac{A}{\alpha}e^{\alpha s} + \frac{B}{\alpha}e^{-\alpha s} \right\} \delta(s-t)ds = Ae^{\alpha t} + Ae^{-\alpha t}, \quad (5)$$

where

$$\dim^{\wedge}(\alpha) = \begin{cases} \alpha, & \text{if } (\alpha) = \dim \Phi_{\alpha}, \forall \geq s \\ 0, & \text{if } (\alpha) = \{\alpha\}, \forall t \geq s \end{cases}, \quad (6)$$

Now show a computational simulation on the recovering and restoring of a quantum system by the Bulnes's operator O_c , (see the figure 2).

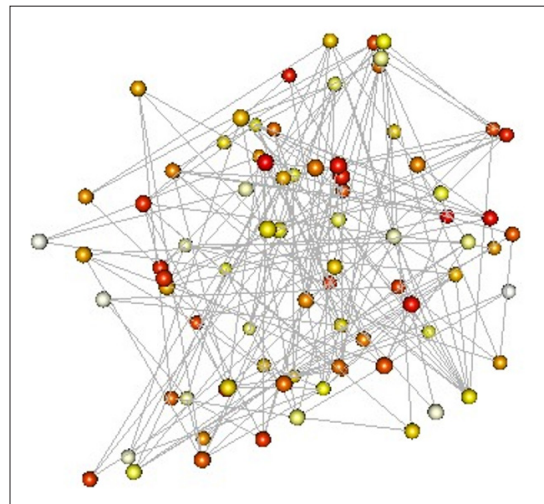


Figure 2: Dynamical graph where quantum states are substituted by another quantum states restoring and replacing in the deep Universe. The yellow vertices represent the particles with good states. The red particles in all ranges represents anomalous particles with anomalous states. The orange vertices represents transition states from the bad until good. This simulation was realized in RStudio [2,7].

Direct Contrast with Standard Quantum Computing

We see the following Table of concepts around the Bulnes's quantum ground operator.

Table 2: Bulnes's Elements To Replace Anomalous Quantum Energy States By "Good" States

Concept	Bulnes's Framework	Standard Quantum Computing / QFT
"Anomalous" State	An energy perturbation or behavioral singularity	A broken symmetry in QFT, or a coherent error/noise state in computing
"Good" State	The natural, free evolution ground state	Target computational state (e.g., $ \psi\rangle$) or a true vacuum state
The Fix Mechanism	Quantum integral transforms using O_c as a kernel	Quantum Error Correction (QEC) , unitary transformation circuits, or dissipative cooling

Conclusions and Additional Notes

The Bulnes's operator O_c directs rather than replaces the Lagrangian. In Bulnes's framework, the quantum ground

¹A quantum state with zero energy can behave like a wave. In quantum mechanics, this concept is most clearly demonstrated through topological zero-modes, where a wave function is mathematically locked at exactly zero energy due to the structural properties of a system, or through specific bound states in the continuum.

operator O_c , is constructed from the classical Lagrangian L , rather than acting as a separate, alternative one. It works by prefixing or constraining the action of the primary Lagrangian into a specific fiber direction (or space-time trajectory).

For another way, a Lagrangian is typically a scalar function or density representing the difference between kinetic and potential energy. In contrast, Bulnes’s quantum ground operator is geometrically defined as a differential 2-form ω_L , [2] on a configuration or tangent space. Its rule of correspondence maps variations via the fiber derivative:

$\omega_L(v) \rightarrow$ derivative along the fiber in the direction v , (7)

Futhermore the role in energy conservation and state support comes garatead by its construction. The main purpose of the quantum ground operator is to serve as the state support for quantum field transformations. While the primary Lagrangian establishes the dynamical forces and equations of motion, the ground operator ensures the stabilization of the system bythis dynamics:

- Maintaining the law of conservation of energy defined by that Lagrangian.
- Providing a geometric "ground" or vacuum-like state to minimize system energy.
- Translating what Bulnes models as "intentional actions" into mathematical field configurations [3,5].

We do a comparison at a glance table.

Table 3: Comparison

Property	Classical/Primary Lagrangian (L)	Bulnes’s Quantum Ground Operator (O_c)
Mathematical Nature	Scalar function / Energy density	Differential 2-form / Operator
Core Function	Defines total dynamics and field equations	Prefixes actions and supports system transformations
Space-Time Role	Integrates over the entire manifold space	Directs the action along a specific fiber coordinate

A universe where the invisible sustains the visible, where the discrete builds the continuous, and where energy follows rules we are only just beginning to understand. Dr. Francisco Bulnes’s research invites us to consider the existence of a hidden foundation—an operator that provides support, direction, and coherence to reality. It is not merely a mathematical theory; it is a new way of asking ourselves what the world truly is.

“The universe does not flow like a continuous river; instead, it beats in invisible pulses—and within each one, a profound architecture sustains the mystery of existence”
We can to say more things about the importance of this operator. Maybe we Will in another paper.

Technical Notation

- O_c -The Bulnes’s quantum ground operator.
- X-Field. In this case an energy manifestation of a quantum system.
- $D_F(\varphi(t))$ -Electronic propagator of an energy state $\varphi(t)$.
- M-Space-time. This is modeled as complex Riemannian manifold whose whose field is $X(M)$.
- J**-Field intention.
- $w(s,t)$ -Weight function. This function represents the anomalous charge that generates a anomalous quantum energy state in a quantum system.
- $*(s)$ -Quantum Anomalous energy state.
- $\dim\Lambda(\alpha)$ -Newman dimension.
- Φ_α -Roots space. This appears in the representation theory of Lie groups and their algebras.
- h -Max Planck constant. Its value is $6.62607015 \times 10^{-34}$ Js(joule $\times$ seconds).
- $|\cdot\rangle$ -Quantum energy state, in the notation of brakets.

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