

Jiahui Zhang^{1, 5 *}, Guangyi Zou³, Zhengxing Peng^{2, 5}, Mengkai Feng⁴
‘1 1 School of Life Science, University of Science and Technology of

China, Hefei, Anhui 230022, China

2 Advanced Light Source, Lawrence Berkeley National Laboratory,
Berkeley, CA 94720, USA

3 School of Mathematical Sciences, University of Science and Tech-
nology of China, Hefei, Anhui 230026, China.

4 Hefei National Research Center for Physical Sciences at the Mi-
croscale, Hefei, Anhui 270026

5 Department of Physics, North Carolina State University, Raleigh,
NC 27695, USA

* jzhang71@ncsu.edu

The zeroth-principles of the Boltzmann extropy in the genralized Minkovski-Hilbert space: the birth of the quantum-relativity statistical mechanism

June 2024

1 Introduction

You know, about creation and annihilation, about me, about the frozen Dirac ocean.

2 Methods

The complex quantum-relativity statistical Boltzmann extropy is defined in the generalized Minkovski-Hilbert space by 4D, 6D, 8D, 12D or arbitrarily dimensional Dirac notation evolved by time-dependent Schrodinger equations, Dirac equations, Lagevian equations, the generalized Langevian equations, Master equation, Newtown equation, Maxwell equations, thermal-dynamics equations and so on.

The Dirac notation is famous known for its simplicity and generalizability in the study of time evolved quantum mechanism system, and traditionally, its only has two components, namely the bra and the ket.

However, for more complex and complicate mathematical-physics spaces such as the geralized Minkovski-Hilbert space, the protein-nucleic acids-small life molecules spaces, and the generalized natural language spaces, the purely usage of the traditional Dirac notation is limited and weak since its disability for taking the many-boy interactions into the consideration.

In this protocol, we first introduce a set of *de novo* notations, namely the arbitrary dimensional Dirac notations for theoretical and

analytical investigation of the full interesting non-equilibrium valuable spaces.

An arbitrary dimensional Dirac notation for the quantumized complex spaces analysis is defined by equation 5.

In this work, we also introduce ...

Finally, we use the machine learning algorithm called KAN to investigate the ...

3 Results

We first display our results by using the one of the simplistic high dimensional Dirac notations, which is the 4D Dirac notations explicitly. In one 4 Dirac notation, a operation is composed of four possible operating systems, namely the bra, the ket, the pu and the nowd. The diagram is showed is figure ...

$$\langle O \rangle_{\text{non-equilibrium}} = \int \langle \text{states} | i \rangle \langle i | O | j \rangle \langle j | \rangle d\text{volume} \quad (1)$$

This definition of the high dimensional Dirac notations are naturally suitable for the investments and analysis of the crystal-based system such as ... In the real world, however, ...

$$\Pi_{f(q)}^{Boltzmann} = \sum_{i=0}^3 \langle \pi_i(q)^{Boltzmann} \rangle_{f(q)} \quad (2)$$

Next, we explicitly do researches on the artificial intelligence-based *de novo* design of the life molecules. The Boltzmann ruin is ...

$$\mu(\text{randomness}) = \sum \mu_{ij}^{\text{PRNG}_{\text{key}=k}}(\text{Gaussian noise}) \quad (3)$$

Finally, we use the recently proposed random field matrix theorem together with the classical theory of functions and functional with real variables to test the robustness of our proposed protocol for the investigation and navigation of the physical phenomenons far from the equilibrium states, eg, the life process...

$$\begin{aligned} P_\theta(x|c_g, c_s) &= \int P_\theta(x|q) P_\theta(q|c_g, c_s) dq \\ &\approx \int \frac{1}{Z} \exp(-\beta F^{eq}(q) + \Pi_{\text{effect}}^{c_s}(q)) \text{decoder}_{\text{co-design}}^{\text{perfect data}}(x|q) dq \end{aligned} \quad (4)$$

$$\Pi_{f(q)}^{Boltzmann} = \sum_{i=0}^{N_0} \langle \pi_i(q)^{Boltzmann} \rangle_{f(q)} \quad (5)$$

XXX

$$\Pi_{f(q)}^{Boltzmann} = \underbrace{\int_0^{\aleph_1} \int_0^{\aleph_1} \cdots \int_0^{\aleph_1}}_{N=\aleph_0} \pi_i d\mu \quad (6)$$

XXX

$$\begin{aligned} \gamma &= \frac{1}{\sqrt{1 - \frac{v^2}{c^2}}} \\ ds^2 &= -c^2 dt^2 + dx^2 + dy^2 + dz^2 \\ \begin{cases} t' &= \gamma \left(t - \frac{vx}{c^2} \right) \\ x' &= \gamma (x - vt) \end{cases} \\ ds^2 &= ds'^2 \end{aligned} \quad (7)$$

XXX

$$\Pi_{\text{zereth-principles}}^{\text{Boltzmann}} = \int_{\text{space}} \pi_i^{\text{Boltzmann}} ds_t^{\gamma(v|c)} \quad (8)$$

XXX

$$\Pi_{\text{zereth-principles}}^{\text{Boltzmann}} = \sum \int_{\text{space}} \pi_{ij}^{\text{Boltzmann}} ds_{ij}^{\gamma(v_{ij} | c)_t} \quad (9)$$

XXX

$$\delta \Pi_{\text{zereth-principles}}^{\text{Boltzmann}} \geq 0 \quad (10)$$

4 Discussion

From the theoretical and numerical analysis from the above mentioned tasks, we can see that ...

More explicitly, in the generalized Minkovski-Hilbert space, the creation and the annihilation of the Boltzmann extropy is ...

However, further works are still needed science ...

We hope that this protocol may give further insights in ...

We would like to thank Dr... and ... *Viva la vida, la inmensa minoría.*