Brief Report

Mesofractal Modeling of Biosystems & Organic Spintronics

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Posted Date: 6 August 2024

doi: 10.20944/preprints202408.0313.v1

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Mesofractal Modeling of Biosystems & Organic Spintronics

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Abstract: Mesoscopic modeling of complex system involve thermodynamic nonequilibrium of discrete scaling. Furthers from quantum correlation on a chip retrieved quantum nonlinear optics with single photons enabled by strongly interacting atoms. Accompanied by mesofractals as development of meso & micro size fractal structures is required to mimic various biological systems for various functions. Showed through fluorapatite in gelatin-based nanocomposite, fractal in DNA knots driven by balance of fission & fusion in mtDNA/mitochondrial DNA mechanism, for optical engines for light energy detection described the proportional integral derivative [PI(D)]-controller set in microbial cells to HCCI/Homogeneous Charge Compression Ignition.

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Introduction

Mesoscopic modeling of complex systems involves thermodynamics nonequilibrium of discrete scaling of entropy reduction + fluctuation, nonlinear dynamics & complexity of self-organized spatio-temporal structure [1] . Electron exchange & electron- or photo-triggered electron exchange which are two central topics in related fields of molecular magnetism & molecular spintronics through control of an external (optical, redox and/or magnetic) properties in the use of several physics (spectroscopic, magnetic, electrochemical and/or photochemical)[2].

Obeys analytical studies of common mechanism of previously named "spinterface" have been forecasted through "mesoscopic physics of electrons & photons" from E. Ackermans & Gilles Montambaux of e.g. the ability to control spin polarization [3] coincides with electromechanical coupling effect between electric polarization & mechanical strain gradient [to mechanical disturbance that propagates in HF Olster**,** 1967]. Furthers from quantum correlation on a chip [Ranojoy Bose, *et.al.*, 2012] those were retrieved quantum linear optics with single photons enabled by strongly interacting atoms provided by Peyrone,there was to concludes above subject to mesoscopic entanglement [4].

Mesofractal and DNA

Accompanied by mesofractals as "development of meso & micro size fractal structures is required to mimic various biological systems for various functions. Meso & micro sized fractal are fabricated by several process in engineering"[5], where we have sought 'mechanical stress mechanisms in the cell [6] flows & percolation accomplishes.

On extensive data sets of fractal fluctuations in Human DNA base CG concentration/10bp(base pairs), the predicted distribution is close to the Gaussian distribution for small-scale fluctuations, but exhibits *fat long tail* for large-scale fluctuations [7].Fractal in DNA knots driven by balance of fission & fusion in mitochondrialDNA.Fractal characteristics also depicted in fluorapatite gelatin-based nanocomposite.

Ever explained :"a useful concept for ecology & sustainability" of efficiency = 1 – [T(o)/T]: "the principles of sustainability to human activities ultimately must result in the scrutiny of all sectors activity to asses the changes required to provide for a high quality of life for future generations"[8].

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Organic Spintronics & PI(D)

Involve the CFD/Computational Fluid Dynamics and HCCI/Homogeneous Charge Compression Ignition, ever defined whereas "ignition model engine" popularly known as a model device diesel engine [9], retrieved the "Laser Doppler Velocimetry/LDV" we intend to compare to Linear Variable Differential Transducer/LVDT includes sensor technology as well as to PVDF.polyvynilidine fluoride comprise giant fluxoelectric in α-phase of PVDF [10]. Further, we guided to properties depict by linear variable differential with PID/the proportional integral derivative [PI(D)]- controller are set in such a using test the best comparison between rising time, overshoot & setting time obtained in the motor response. [The control system being used on FTU Plant is formed by a PXI EC-based platform supervise to[11].

Also offered the spintronics using of "PI(D)-controller, from Microbial Cell to the Motor Response in Plasma Heating", spintronics theirselves involved in the study of active control & manipulation of spin degrees of freedom in solid-state system, we comprise in weight spin relaxation & dephasing are process that guides "equilibration"[12].

We intended to accomplish the HCCI quoted in two & three characters seems twin-compared Homogeneous Charge Compression Ignition viewed through IceCube Document Project held since Oct 11, 2001 ever concluded as "*saw none"* so they can be followed the ITER/International Thermonuclear Experiment Reactors to IFMIF/International Fusion Materials Irradiation Facilities.

Refer to "magnetic quantum-dot cellular automata which is nonvolatile & lower power consist of nanomagnets. Since they are magnetically coupled, logic can be peformed by switching an input nanomagnet which causes a chain reaction of switching on the other element in a domino fashion"[13].

For disproportionation of H_2O_2 we also considers an electrokinetic mechanism they appears. So far, the more efficient micro/nanoscale motors are derived from biological systems [14].Besides, a control experiment using three stripped Au/Pt/Au rods with catalyzed the composition of H_2O_2 are at similar rate" [15].

Conclusions

From a study of building meso fractals, the fractal & mesofractal application to organic spintronic if he related to PI(D) have been extended, at least ranging from DNA knots in mitochondrial fission & fusion mechanism, with some explanation to organic magnetism, quantum optics & optical engine.

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