

Short Communication

Mesofractal Modeling of Biosystems & Organic Spintronics

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Abstract

Mesoscopic modeling of complex systems involves thermodynamic nonequilibrium of discrete scaling. Further from quantum correlation on a chip retrieved quantum nonlinear optics with single photons enabled by strongly interacting atoms. Accompanied by mesofractals as the development of meso & micro size fractal structures is required to mimic various biological systems for various functions. Shown 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.

More Information

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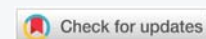
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Introduction

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

Obeys analytical studies of a 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 the mechanical disturbance that propagates in HF Olster, 1967]. Further 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 conclude 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 fractals are fabricated by several processes 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 a *fat long tail* for large-scale fluctuations [7]. Fractals in DNA knots are driven by the balance of fission & fusion in mitochondrial DNA. Fractal characteristics are 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].

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/LVDV includes sensor technology as well as to PVDF.polyvynilidene fluoride comprise giant fluxoelectric in α -phase of PVDF [10]. Further, we guided to properties depicted 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 the FTU Plant is formed by a PXI EC-based platform supervised to [11].

Also offered the spintronics using of “PI(D)-controller, from Microbial Cell to the Motor Response in Plasma Heating”, spintronics themselves involved in the study of active control & manipulation of spin degrees of freedom in a solid-state system, we comprise in weight spin relaxation & dephasing are a 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 the 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 are nonvolatile & lower power consist of nanomagnets. Since they are magnetically coupled, logic can be performed by switching an input nanomagnet which causes a chain reaction of switching on the other element in a domino fashion” [13].

For the disproportionation of H_2O_2 , we also consider an electrokinetic mechanism that 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 catalyzed the composition of H_2O_2 at a similar rate [15].

Conclusion

From a study of building meso fractals, the fractal & mesofractal application to organic spintronic if related to PI(D) has 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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