American Journal of Engineering and Applied Sciences

Technical Reports

A Quantum Observation Technique: The 'Celalettin-Field Quantum Observation Tunnel' in an IC-Manifold and the 'Celalettin Tunnel Conjecture'; a Short Communication

[1]Metin Celalettin and [2]Horace King

[1]*TEPS, Victoria University, Australia*
[2]*College of Engineering and Science, Victoria University, Australia*

Article history
Received: 31-12-2019
Revised: 30-01-2020
Accepted: 31-01-2020

Corresponding Author:
Metin Celalettin
TEPS, Victoria University,
Australia
Email: metin.celalettin@live.vu.edu.au

Abstract: The 'Celalettin-Field Quantum Observation Tunnel' (Celalettin Tunnel) is a quantum observation technique. It is within a pneumatic manifold of Euclidean space where the randomness of particle Orbital Angular Momentum (OAM) is mitigated via electric polarization. It is described by the Celalettin Tunnel Conjecture. The presence of an electric field affects the nuclear spin of the particles within the pneumatic manifold. The manifold, namely the IC-Manifold, or Invizicloud© is unique as its axioms are a combination of classical and quantum non-logical parameters. The IC-Manifold has a variable density and exists only according to 'Celalettin's two rules of quantum interaction':

1. Quantum interaction causes quantum observation during fundamental particle interactions with orbital angular momentum electric polarized atoms within the IC-Manifold causing depolarization.
2. The photoelectric effect is not limited to solids but can occur in an IC-Manifold.

Keywords: Celalettin Tunnel Conjecture, Quantum Observation

Celalettin Tunnel; The technique

Anti-ferromagnetism affects the OAM spin within pneumatic matter (Raicher *et al*., 2014; Lanzagorta, 2011). The IC-Manifold is illustrated in the directions of the nuclear spins of a pneumatic ensemble of particles represented as arrows (Fig. 1).

The Celalettin Tunnel theoretically works similarly to magnetic resonance imaging (Salerno *et al*., 2002; Walker and Happer, 1997). An entangled photon depolarizes Helium-3 atoms as it burrows through the IC-Manifold and creates a tunnel (Celalettin and King, 2018). The depolarized particles are considered a single quantum system and can be used to acquire information on the signaller (Celalettin and King, 2018; Bassi *et al*., 2013; Gaëtan *et al*., 2009; Zurek, 2006; Heisenberg, 1985). The photon would become weaker as it scattered through an ensemble of atomic Helium-3 until it was absorbed or escaped (Christillin, 1986; Joos *et al*., 2013; Singh *et al*., 2016).

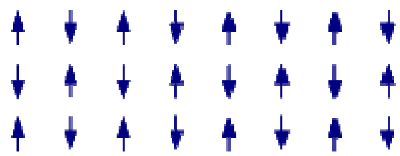

Fig. 1: Antiferromagnetic ordering

At Fig. 2, the Celalettin Tunnel is made from the collective depolarized electrons in the IC-Manifold after the signaller has penetrated it (Salerno *et al*., 2002; Celalettin and King, 2018; Stewart, 2005; Fox, 1987). Immediately after the signaller produced a tunnel through the IC-Manifold (Celalettin and King, 2018; Heisenberg, 1985; Raicher *et al*., 2015; Heisenberg and Bond, 1959). If a gas is subject to anti-ferromagnetism its intrinsic spin properties will polarize and portray entropy attributes such like a solid (Walker and Happer, 1997; Gachet *et al*., 2010; Shirley, 1965). Those affected

DOI: 10.3844/ajeassp.2020.56.60

atoms could emit a bound electron depending on the photon's energy, given:

$$\frac{n_{i+1}+n_e}{n_i}=\frac{2}{\lambda^3}\frac{g_{i+1}}{g_i}\exp\left[-\frac{(\epsilon_{i+1}-\epsilon_i)}{k_BT}\right] \tag{1}$$

Where:
n_i = The density of atoms in the i-th state of ionization, that is with i electrons removed
g_i = The degeneracy of states for the i-ions
$\square_i$ = The energy required to remove i electrons from a neutral atom, creating an i-level ion.
n_e = Is the electron density
λ = The thermal de Broglie wavelength of an electron

We use the classical models by considering the classical spins with magnetic moments µA 6 = µB. To simplify we assume that nuclear spin interaction is disordered of the Heisenberg form (Heisenberg, 1985; Fukushima, 2015; Brandsema *et al*., 2014). So, the ferromagnet model described by the classical Hamiltonian of the type:

$$\langle \zeta_{i,\alpha}(t)\zeta_{j,\beta}(t')\rangle = \frac{2\lambda_i k_B T}{u_i\gamma_i}\delta_{ij}\delta_{\alpha\beta}\delta(t-t') \tag{2}$$

$$H_{i,tot} \equiv -\frac{1}{\mu_i}\frac{\partial\mathcal{H}}{\partial s_i} = H + \frac{2D_i}{\mu_i}s_i^z e_z + \frac{1}{\mu_i}\sum_{j\in neig(i)} J_{ij}s_{ij} \tag{3}$$

Where:
H = Hamiltonian
N = Total number of spins
I and J = Lattice sites
D_i = The anisotropy constant of site I
$|S_i|$ = The third sum is over neighbour pairs
J_{ij} = JAA(BB)>0 Heisenberg exchange interaction parameter
λ_i = Is the coupling to the heat bath parameter
a, B = Cartesian Z components heat bath and T is the temperature

Each point of an n-dimensional manifold has a neighbourhood or a set of points acting like barriers, defining the region where the content within the IC-Manifold can exist, or the walls of the IC-Manifold itself (Gachet *et al*., 2010; Haroche, 1999). Helium-3 has an intrinsic nuclear spin of ½ and can be hyperpolarized by spin exchange optical pumping. Depolarization occurs to make way for the quantum entangled photon (Walker and Happer, 1997). Hyperpolarization using non-equilibrium means for spin-exchange optical pumping is achieved by Coulomb Forces; such that:

$$F=\frac{1}{4\pi\varepsilon_0}\frac{qQ}{r^2}=k_0\frac{qQ}{r^2} \tag{4}$$

where, r is the distance between the two charges q and Q Newtons.

Given the Boltzmann equation to accommodate the density of the environment in which the photon-electron interactions will occur in the presence of an electric field:

$$n_e(\phi_2)=n_e(\phi_1)e^{e(\phi_2-\phi_1)/k_BT_e} \tag{5}$$

Where:
n_e = Electron number density
T_e = Temperature of the plasma and
k_B = Boltzmann constant.
φ = Work function

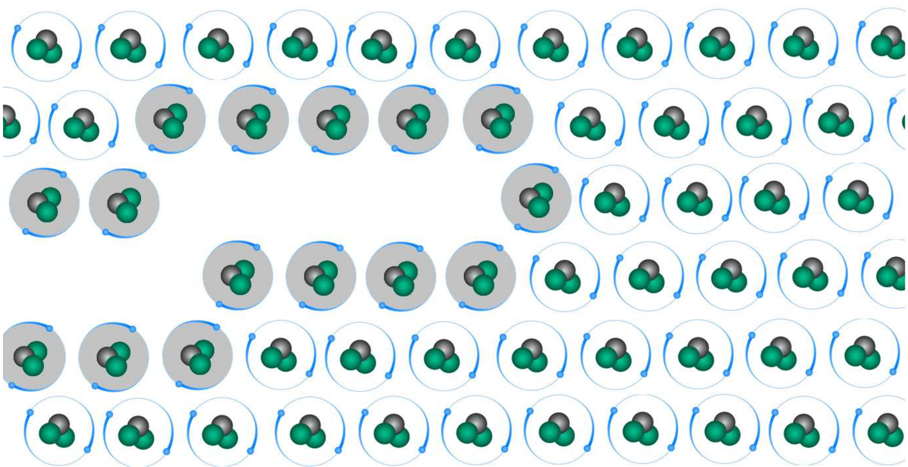

Fig. 2: Celalettin-Field quantum observation tunnel in an IC-Manifold (Helium-3 atoms in grey have been depolarized)

Celalettin Tunnel; The Conjecture

In an IC-Manifold, the Celalettin Tunnel is theoretically produced by an incoming entangled photon. When viewed as a single quantum system, the collectively affected Helium-3 atoms describe the photon.

The Schrodinger wave function equation:

$$\nabla^2\psi + \frac{8\pi^2 m}{h^2}(E - V)\Psi = 0 \tag{6}$$

where the Laplacian of a scalar for spherical coordinates is given by:

$$\begin{aligned}\Delta f &= \frac{1}{r^2}\frac{\partial}{\partial r}\left(r^2\frac{\partial f}{\partial r}\right) + \frac{1}{r^2\sin\theta}\frac{\partial}{\partial\theta}\left(\sin\theta\frac{\partial f}{\partial\theta}\right) + \frac{1}{r^2\sin^2\theta}\frac{\partial^2 f}{\partial\varphi^2} \\ &= \frac{1}{r}\frac{\partial^2}{\partial r^2}(rf) + \frac{1}{r^2\sin\theta}\frac{\partial}{\partial\theta}\left(\sin\theta\frac{\partial f}{\partial\theta}\right) + \frac{1}{r^2\sin\theta}\frac{\partial^2 f}{\partial\varphi^2}\end{aligned} \tag{7}$$

Where:
E = Energy
V = Potential energy
m = Mass
h = Planck's constant
φ = The azimuthal angle and
θ = The zenith angle or co-latitude

Rearranged to express quantum entangled photons in a quantum radar:

$$|\Psi\rangle = \frac{1}{\sqrt{2}}\left(|e,\alpha e^{i\phi}\rangle + |g,\alpha e^{-i\phi}\rangle\right) \tag{8}$$

Where:
αe = Eigenvalues
e = γ_{sig}
g = γ_{idler}

Bra-Ket Notation

An electron's spin: |↑|↑
With an observer: |↑|obs|↑|obs
For an entangled quantum system: |↑⟹(|→+|←)/2–√|↑⟹(|→+|←)/2
Where the observer is added: |↑|obs⟹(|→+|←)|obs/2–√|↑|obs⟹(|→+|←)|obs/2

If the observer can measure the state, then the state of the observer changes and the observer can no longer be factored out of the whole state: (|→|obs1+|←|obs2)/2–√(|→|obs1+|←|obs2)/2. The quantumness of |obs1≠|obs2|obs1≠|obs2 describes the electron spin as not acting quantum mechanically and hence decoherence is achieved (Panarella, 1987).

Spin exchange optical pumping can be represented by:

$$P_N(t) = \langle P_A\rangle\left(\frac{\gamma_{SE}}{\gamma_{SE}+\Gamma}\right)\left[1 - e^{(\gamma_{SE}+\Gamma)t}\right] \tag{9}$$

Where:
$P_N(t)$ = Nuclear polarization (spin)
$\langle P_A\rangle$ = The atom's polarization
γ_{SE} = The spin exchange rate
Γ = The longitudinal relaxation rate

The Lagrangian scalar formulation to investigate the required kinetic energy of a photon to cause the Celalettin Tunnel (Haroche, 1999). It is given by:

$$\begin{aligned}&\mathcal{L}_{sQED} = \frac{1}{2}\left[\left(\partial_\mu + ieA_\mu\right)\Phi^*\right]\left[\left(\partial^\mu - ieA^\mu\right)\Phi\right] \\ &-\frac{1}{2}M^2\Phi*\Phi - \frac{1}{16\pi}F_{\mu\nu}F^{\mu\nu}\end{aligned} \tag{10}$$

Where:
Φ = Charged scalar field,
$\Phi*$ = Its complex conjugate

The electromagnetic strength required is given by Faraday's law of induction. The trajectory of an ensemble of particles is derived from the Lagrange equations, where the Euler-Lagrange equation describes the motion for the scalar field (Raicher *et al*., 2014):

$$\frac{\delta\mathcal{L}}{\delta\Phi*} = \partial_\mu\frac{\delta\mathcal{L}}{\delta\left(\partial_\mu\Phi*\right)} \tag{11}$$

Yielding the Klein-Gordon (Raicher *et al*., 2015):

$$\left[-\partial^2 + M^2\right]\Phi = \left[-e^2A^2 + 2ieA\cdot\partial\right]\Phi \tag{12}$$

Where:
∂^2 ≡ $\partial\mu\partial\mu$,
A^2 ≡ $A\mu A\mu$
$A\cdot\partial$ ≡ $A\mu\partial\mu$

Further:

$$\frac{d^2y}{dx^2} + (a - 2q\cos 2x)y = 0 \tag{13}$$

where, a and q are the quantum parameters.

That is repolarizing the Celalettin Tunnel within the IC-Manifold. That time is expected to occur, given:

$$M_{xy}(t) = M_{xy}(0)e^{-t/T_2} \tag{14}$$

Where:

M_{xy} = The transverse component of the magnetization vector
T_2 = A time constant characterizing the signal decay
e = Euler's number

A 'Celalettin Tunnel Conjecture' can therefore mathematically be described:

$$T_{Celalettin} = \Psi, Ce_n, \mathcal{L}_{QED}, P_N(t) \quad (15)$$

Where:

$T_{Celalettin}$ = The Celalettin Tunnel
Ψ = The Schrodinger equation
Ce_n = The Mathieu differential equation
$\mathcal{L}_{QED}$ = Symbolizes Lagrangian QED
$P_N(t)$ = The rate of nuclear spin repolarization

Conclusion

While the Celalettin Tunnel Conjecture may be a far reaching and radical theory and initially seem philosophical and preposterous, it adheres to a list of governing equations that enable it in theory. Until such time as it is modelled considering density and time, it cannot be dismissed.

Acknowledgment

I would like to thank Dr Horace King for his endless support and profound expertise with the wave function and Maxwell Equations. Without his suppot I could never have been so bold.

Authors Contributions

All authors equally contributed in this work.

Ethics

This article is original and contains unpublished material. The corresponding author confirms that all of the other authors have read and approved the manuscript and no ethical issues involved.

References

Bassi, K. Lochan, S. Satin, T.P. Singh and H. Ulbricht, 2013. Models of wave-function collapse, underlying theories and experimental tests. Rev. Modern Phys., 85: 471-471. DOI: 10.1103/RevModPhys.85.471

Brandsema, M.J., R.M. Narayanan and M. Lanzagorta, 2014. Design considerations for quantum radar implementation. Proc. SPIE, 9077: 90770T-1-90770T-1.

Celalettin, M. and H. King, 2018. The 'celalettin-field quantum observation tunnel'; a quantum communication countermeasure speculative structure. Sch. J. Applied Sci. Res., 1: 5-9. DOI: 10.3844/ajeassp.2019.111.117

Christillin, P., 1986. Nuclear Compton scattering. J. Phys. G: Nucl. Phys., 12: 837-851. DOI: 10.1088/0305-4616/12/9/008

Fox, 1987. An introduction to the calculus of variations. Courier Corporation.

Fukushima, K., 2015. Electronic structure calculations for anti-ferromagnetism of cuprates using SIWB method for anions in DV and a density functional theory confirming from finite element method. Adv. Quantum Chem., 70: 1-29. DOI: 10.1016/bs.aiq.2014.07.001

Gachet, D., S. Brustlein and H. Rigneault, 2010. Revisiting the Young's double slit experiment for background-free nonlinear Raman spectroscopy and microscopy. Phys. Rev. Lett., 104: 213905-213905. DOI: 10.1103/PhysRevLett.104.213905

Gaëtan, A., Y. Miroshnychenko, T. Wilk, A. Chotia and M. Viteau *et al*., 2009. Observation of collective excitation of two individual atoms in the Rydberg blockade regime. Nature Phys., 5: 115-115. DOI: 10.1038/nphys1183

Haroche, S., 1999. Cavity quantum electrodynamics: A review of Rydberg atom-microwave experiments on entanglement and decoherence. AIP Conf. Proc., 464: 45-66. DOI: 10.1063/1.58235

Heisenberg, W. and B. Bond, 1959. Physics and philosophy: The revolution in modern science. Allen and Unwin, St. Leonards, Australia.

Heisenberg, W., 1985. Über den Anschaulichen Inhalt der Quantentheoretischen Kinematik und Mechanik. In: Original Scientific Papers Wissenschaftliche Originalarbeiten, Blum, W., H. Rechenberg and H.P. Dürr (Eds.), Springer, Berlin, pp: 478-504.

Joos, H., D. Zeh, C. Kiefer, D.J. Giulini and J. Kupsch *et al*., 2013. Decoherence and the Appearance of a Classical World in Quantum Theory. 2nd Edn., Springer Science and Business Media, Berlin, ISBN-10: 3662053284, pp: 46.

Lanzagorta, M., 2011. Quantum radar. Synthesis Lectures Quantum Comput., 3: 1-139. DOI: 10.2200/S00384ED1V01Y201110QMC005

Panarella, E., 1987. Heisenberg uncertainty principle. Annales de la Fondation Louis de Broglie, 12: 165-193.

Raicher, E., S. Eliezer and A. Zigler, 2014. The Lagrangian formulation of strong-field quantum electrodynamics in a plasma. Phys. Plasmas, 21: 053103-053103. DOI: 10.1063/1.4875742

Raicher, E., S. Eliezer and A. Zigler, 2015. A novel solution to the Klein-Gordon equation in the presence of a strong rotating electric field. Phys. Lett. B, 750: 76-81. DOI: 10.1016/j.physletb.2015.08.056

Salerno, M., E.E. de Lange, T.A. Altes, J.D. Truwit and J.R. Brookeman *et al*., 2002. Emphysema: hyperpolarized helium 3 diffusion MR imaging of the lungs compared with spirometric indexes-initial experience. Radiology, 222: 252-260. DOI: 10.1148/radiol.2221001834

Shirley, H., 1965. Solution of the Schrödinger equation with a Hamiltonian periodic in time. Phys. Rev., 138: B979-B979. DOI: 10.1103/PhysRev.138.B979

Singh, S. Antony and R.M. Jha, 2016. Plasma-Based Radar Cross Section Reduction. In: Plasma-based Radar Cross Section Reduction, Springer, Singapore, pp: 1-46.

Stewart, J., 2005. Angular momentum of the electromagnetic field: The plane wave paradox resolved. Eur. J. Phys., 26: 635-635. DOI: 10.1088/0143-0807/26/4/008

Walker, T.G. and W. Happer, 1997. Spin-exchange optical pumping of noble-gas nuclei. Rev. Modern Phys., 69: 629-629. DOI: 10.1103/RevModPhys.69.629

Zurek, W.H., 2006. Decoherence and the Transition from Quantum to Classical-Revisited. In: Quantum Decoherence, Duplantier, B., J.M. Raimond and V. Rivasseau (Eds.), Springer, pp: 1-31.