Report on a Study upon Basic Issues of Light and Entropy

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[Abstract]: The text summed up the newest observational progress of oscillation for the speed of light and open entropy in recent years ,as well as theoretical research dynamic. The text put forward new theoretical opinion and pointed out the important role of these work in connecting quantum mechanics by opening out mutual connection and existent problems between the oscillation for the speed of light and open entropy.
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1 Foreword

The oscillation for the speed of light and open entropy , are still the important research topic of theoretical physics and experimental physics[1] for a long time, All these whether raising new problems or raising new interpretations or making new observations about the oscillation for the speed of light and open entropy, all have important scientific significance to the study of basic physics and the development of related subjects.

2 The observational progress of the oscillation for the speed of light and new discussion

In 2008, Norbert · Werner, an astronomer, and his research group, by utilizing the Newton X-ray satellites (XMM) from the European Space Agency, found out partial "invisible" universal gas net of low density, and found there was a hot gas bridge or thread to connect two galaxies together.It may prove that the so-called singularity perturbation, which can be functional through Einstein-Rosen Bridge, whose principle is similar with the theory of "butterfly effect" (Q Ψ) [2]. $\Psi = a_o \exp[i(Et - p\,r)/h]$, $u=c^2/v$. Recently, poshak Gandhi Et al Scientists find that there is huge energy flow in the center of black hole by observing ficker between two black holes[3]. The shows that the quasar burst can activate, oscillate and decay the neutrino particles in the black hole with the supercritical high-temperature and high-frequency medium (The sound wave of onflow QSO vibrantly shoot the neutrino absorbed by black hole with a energy far more than 5×10^{19} electron volt)[4,5]. The quasar wind that has the superconductive and superluminal quantum magnetic field can shield the radiations like the dark matter—gravitational wave in the boundary and change it into ordinary matter . Through a careful counting of the entropy taken out by the emitted particles, we show that the black hole radiation[6] as tunneling is an entropy ($S=Akc^3/4Hg$) conservation process. While information is leaked out through the radiation ($T=hc^3/8\pi kGM$), the total entropy is conserved. Thus, we conclude the black hole evaporation process is unitary [7] .

Gravitation undulates each other by medium to transform potenital energy into kinetic energy. Low-density degenerate matter expands quickly,space region formed by it is large,and the curvature is small and the speed of light is quick in such space region. The dark energy makes the opening universe under critical density eternally expanding with an accelerated velocity, gravity velocity may be breached before unlimited rarefaction of universe substance density, the universe may loss gravitation. Associated serial formula is showed as following, $ds^2 = -dt^2 + d L^2$, $m=QRB/V$, $R=1/r$, $H(t) = \dot{R}(t)/R(t)$, $GM/R_1 = g_1 < GM/R_2 = g_2$. $V = 1/\rho_{eff}\, m$, $d^2a/dt^2 > o$, $a(t) \to C$, $H = (8\pi G t_c^4/3)^{1/2}$.

In 1987, Japan's kamiokande II detector and America's IMB test discovered the neutrino of supernova SN1987a, 3 hours earlier than the light ray coming to Earth. $y(z,t) = \square[A e^{j\varphi} \exp\square(jkiri)]$, $C(t) -- V(t) = \int_a^b \sqrt{1+[f'(x)]^2}\, dx/C - L/V = \Delta t = 3$ *hours*. Decay oscillation of neutrino involved in weak force suffers no restriction of curved space. Recently, Helvetic scientist have validated successfully that two seperated photons in entangled state transmit message at the speed of superluminality [8] . Instantaneity of Quantum Entanglement State may indicate time has quantization, observing Quantum Entanglement State may induce quantum of time to oscillate or collapse (decoherence) [9] . The carrier of time is possibly a photon[10], which can reasonably explain why quantum

entangled state is nonlinear; why information interruption occurs in superluminal motion; why time stop occurs in black hole event horizons[11], and why Planck time has no simultaneity and non-repeatability. The nature of light is transition transmission of atomic radiations of specific energy state, that is, the secondary effect of atomic radiations. Webb, Australian scholar, found, in the observation of action spectrum emitted by quasar 12 billion light-years distance away from the earth, that in past 12 billion years, with regard to component of accurate structural constant $a=e^2/Ch$ of action spectrum, light velocity has reduced by 1/100000. Medium produces polarized beams. The temperature of the early universe was 9.15K, so the rotation rate of photon may be different from the present photon. The mechanism of entangled state of the quantum may be the near field with frequency-coupled phase wave of the photon, and the conjugated distant field. Redshift rate of one OQ172 quasar observed in early period of space was $Z=\triangle\lambda/\lambda_0\approx3.53$. Given that Hubble constant value at present is $71kM\bullet s^{-1}\bullet MPC^{-1}$, from calculation of $d_L=C[R_0/R(t_1)-1]/H_0$, its moving back speed is 0.91C 14 billion light-years away from earth, regarding the Lorentz factor is about 400.The current observed phenomenon of bending of light (Closed-loop light) and mixing of spectrum may prove that the speed of light is oscillating and photons also have fermion nature . A division by statistics shows that: Fermion satisfies Fermi-Dirac statistics, and boson satisfies Bose-Einstein statistics. However, in case that there is an obvious correlation effect, the Fermi System will generate non-Fermi-liquid behavior[12], namely, deviating from the Fermi statistics.

In 2010, an American physicist in Syracuse University came up with a new theoretical model violating Pauli exclusion principle in *Physical Review Letters*, namely, more than one electron can be in the same quantum state at the same time in specified natural conditions. In addition, boson will also deviate from the Bose statistics. A division by spin shows that: It is Fermion if s (spin) is half-odd, and it is boson if s is zero and integer. When correlation effect among particles is negligible, such as in SEE (single event effect), such division is appropriate. However, when correlation effect is obvious, shielding phenomenon will appear among electric charges, so that one particle will have its effective charge reduced and also its effective spin will carry out with some discount. In such event, problems will appear when fermion and boson are divided by spin. Probability that coupled high frequency photons exist two attributes which are boson and fermion[13]. Spin of photon may be relevant to energy state of photon and momentum [14] . The change of the speed of light may change spin quantum number of photon. In the condition of microspur, electromagnetic wave may produce coupling and resonanance tunneling, then photoelectricity may produce transition spontaneously and break away from degeneracy to make itself be at supersymmetric compatible quantum state [15] . Scientists of University of Oxford recently reported on the journal Science that they observed E8 symmetry in ultracold electrons for the first time. The research indicates that vacuum (A group of physicists working out of Chalmers University of Technology in Gothenburg, Sweden, have succeeded in proving what was until now, just theory; and that is, that visible photons could be produced from the virtual particles that have been thought to exist in a quantum vacuum . The team describes how they used a specially created circuit called a superconducting quantum interference device “SQUID” to modulate a bit of wire length at a roughly five percent of the speed of light, to produce visible "sparks" from the nothingness of a vacuum) [16] or field maybe a critical state of mass energy phase transition. Recently, researchers from the University of Cambridge and University of Birmingham of UK verify through researches that electron can crack into spintron and Holon. Thus it can be concluded that spintron can further crack into magnetic-monopoles [17] , there is possibility of butterfly effect of electromagnetic oscillation for spintron and holon of many-body electron. The proton [18] spin crisis may lie in three quarks constituting the proton, which is a superposition state of resonance transition of single non-polarised spin quark with compound spin and asymptotic freedom.

3 The observational progress of open entropy and new discussion

In 2008, Erez Et al published the thesis in *Nature* magazine. Their study discovered that the measurement process of quantum (“Maxwell’s demon”) controlled the thermodynamics action in the quantum system that is composed of two energy levels. The second law of Thermodynamics is not tenable strictly any more [19]. The dynamics of the clock is studied in terms of an unstable evaporation or condensation model for the granular gas. In this model, the temperatures of the two types of grains are considered to be different, and they are functions of the composition of the gas. Oscillations in the system are driven by the asymmetric collisions properties between the two types of grains [20]. A recursion formula is derived for the partition function to simplify the summation of hole configurations. This allows the thermodynamic quantities of this model to be rigorously determined in the thermodynamic limit [21], discrete space entropy, Associated serial formula is showed as following,

$ds=d_es+d_is$, $\rho_{eff}/t^2=H(t)/T<C$, $\rho_{eff}/t^2=H(t)/T<\rho_c$, $\Gamma/H<n$, $d_is\geqslant 0$, $\rho_{eff}=pv\lambda$, $P=mV(m=E/c^2,V=c/n)$, $V\geqslant C$, $d_es<0$, $C\leqslant\rho_{eff}/t^2=H(t)/T$, $\rho_{eff}/t^2=H(t)/T>\rho_c$, $\Gamma/H>n$, $G=H-TS$, $t=-i\,1/k_BT$, $d_iS_1=0$, $d_iS_2=0$ & $d_iS=0$, $d_iS_1<0$, $d_iS_2>0$ & $d_iS>0$. Parameters of the quantum fluctuations, which is in an open system threshold, control entropy changes. Change of energy state is the reason that acceleration produces, $\triangle E=\pm a$.

4 Conclusion

The problems about the oscillation for the speed of light and open entropy, as well as new study and observational progress, all play an important bridge role in quantum uncollapse to connect the gray area of transition between micro-physics and quantum physics and to connect general relativity and quantum mechanics.

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