A pragmatic approach to define a unifying field using evidence-congruent logics

CHANDRASEKHAR ROYCHOUDHURI
Physics Department, University of Connecticut, Storrs, CT, USA
Chandra.Roychoudhuri@uconn.edu

Abstract
[Suggested section: Unification]

Our approach to this paper is to utilize the common factor(s) behind the currently successful theories modeling interactions between EM waves and particles. Maxwell's wave equation tells us that EM waves are harmonic oscillators, $\exp(-i2\pi f_{em}t)$, where f_{em} represents the harmonic oscillation of the electric vector in *space;* and during spontaneous emission, this entity starts out as a packet of energy hf_{em}. Schrodinger's "wave" equation implies that particles of internal energy hf_{pr} can also be represented as harmonic oscillators, $\exp(-i2\pi f_{pr}t)$. The energies at two QM-allowed internal energy states, m and n, can be expressed as $\exp(-i2\pi f_{pr.m}t)$ and $\exp(-i2\pi f_{pr.n}t)$. Therefore, when the particle undergoes a QM-allowed transition by emitting a photon wave packet, its frequency is given by $hf_{em:n\to m} = hf_{pr:n} - hf_{pr:m}$. Thus, Schrodinger's successful "wave mechanics" remains congruent for energy transfers; but QM does not define conclusively what physically "waves" inside particles. Therefore, the purpose of this paper is to define what "oscillates", not "waves".

First, however, we need to take care of de Broglie's "Pilot wave", since this has been used by founders of QM as the solution to particle "waving". De Broglie proposed that particles with kinetic energy behave like waves and used the phrase "Pilot wave" with the relation $\lambda = h/p = h/m\mathrm{v}$. Various superposition experiments validates this expression. Unfortunately, we keep ignoring that the de Broglie relation becomes non-physical, because for $\mathrm{v} = 0$, $\lambda = \infty$. All particles and their assemblies always have almost incompressible finite physical volume for all practical velocities. That is our daily experience. Therefore, this is an opening for a better concept. First, to preserve the correctness of particle superposition effects, we need to define a real physical *harmonic oscillation* for particles. We postulate that particles acquire *external* macro harmonic oscillation, $\exp(-i2\pi f_{kn}t)$, to acquire its kinetic energy (velocity), which can be given by $hf_{kn} = m\mathrm{v}^2/2$. This is a causal relation, since for $\mathrm{v} = 0$, $f_{kn} = 0$; a stationary particle does not carry out external macro oscillation, however, it preserves its internal fixed energy hf_{pr} and the internal torus-like oscillations $\exp(-i2\pi f_{pr}t)$, responsible for phase-guided quantum mechanical interactions, which follows the Superposition Principle. For this approach, internal energy of particles hf_{pr} are generally quantized; unlike the kinetic energy hf_{kn}, since v can assume all possible continuous values. Therefore, the so-called "key mystery" of QM lies in the detection (interaction) process of the "diffracted" particles, but not during its free propagation from the generating oven up to the detector plane!

We now try to accommodate the 1st postulate of Special Relativity (SR) a bit differently, following Maxwell. Since, $c^2 = \varepsilon_0/\mu_0$, and EM waves are classical waves, ε_0 and μ_0 must be the two key

characteristic tension properties of a cosmic medium that we will call, the Complex Tension Field (CTF). CTF must pervade all of cosmic space since light travels everywhere in this space with the same velocity, c. Now, to preserve the validity of Michelson-Morley experiment, we postulate that elementary particles are localized torus-like, self-looped and self-resonant oscillations of the same CTF. Hence, when these torus-particles, or their assemblies are given some translational movement, they would not drag the parent CTF, as they are simply excited states CTF, just like the EM waves are its propagating linear excited states and does not drag the CTF.

The paper will explain many other physical phenomena, mostly optical, to demonstrate that the postulate of CTF can bring much more harmony between classical and quantum physics. This is especially true when we accept the postulate, following General Relativity, that all the forces are simply different kinds of "curvatures of space" generated in the CTF due to the very torus-like oscillations of the "particles".

[1]. C. Roychoudhuri, "Next Frontier in Physics - Space as a Complex Tension Field", Journal of Modern Physics, 2012, 3, 1357-1368. Free download:
http://dx.doi.org/10.4236/jmp.2012.310173

[2] C. Roychoudhuri, see Ch.11 in "Causal Physics: Photon by Non-Interaction of Waves", Taylor & Francis, 2014.