STOE assumptions that model particle diffraction and that replaces QM

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Abstract

The STOE originally was a model to describe mysterious cosmological observations. The STOE has explained Young's Experiment and light as photons. It also predicted the result of The Hodge Experiment that differentiates between particles (photons) and waves going through the slits. The assumptions used in the STOE explanation and the computer simulation are many over several papers. This paper lists the assumptions used to form the equations. The advantages of the STOE are that it is one model of the big, the Newtonian scale, and the small of light and that it is more intuitive.

Diffraction, Interference, wave–particle duality, Newton Interpretation, Theory of Everything, STOE.

1 INTRODUCTION

A successful particle model of light has been developed. The model accurately described the screen pattern of Young's experiment while falsifying wave models of light. Further, the model predicted the result of varying the intensity of light across the slit (Hodge experiment) (Hodge 2015b). The model required several assumptions across several papers.

Standard models of General Relativity (GR) and of Quantum Mechanics (QM) are contradictory. The long sought Theory of Everything (TOE) could be one or the other applied to the scale of the other or something entirely different. GR is a basic Newtonian model (matter warps space, space directs matter) which is the Scalar TOE (STOE). The STOE corresponds to both GR and QM. A summation of the application of the STOE to the universe is in Hodge (2015c).

The STOE suggests the One Universe Principle and its corollary that the universe is fractal (self similar) on all scales. The quantum world should obey the same equations as our everyday world. The surface appearance of the physical world is the same as its deep structure. The scale difference then requires new

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models to show the similarity. The QM model and its bizarre suggestions such as wave-particle duality, observer dependence, and entanglement need to be re-addressed in everyday terms. That is what the STOE does.

The Negative Feedback Loop (NFL) Principle posits the universe's processes are controlled by nested NFLs. The illusion of "fine tuning" a parameter is the result of an NFL in operation. For example, The temperature of the universe is controlled by such process as demonstrated in Hodge (2006). A corollary is that any parameter or process not in a NFL becomes unstable and eventually ceases to exist. This can occur during critical changes such a change of temperature.

If there were only one constituent of the universe, everywhere would be sameness. Two constituents is the smallest possible number of constituents. Mathematics has demonstrated that it is the basis of understanding of the physical universe. Therefore, it is indicating something very basic about the universe. The two basic forms of mathematics may be the analogy of the forms of the constituents. The basis forms are geometry (continuous, extended) and algebra (discrete, counting). More complex forms are constructed from these two basic forms. Also, there are two forms of energy - Kinetic and potential. There are two forms of mass - inertial and gravitational.

The STOE postulates there are just 2 constituents (after Democritus) and their interaction in our universe. The names given are hods for the discrete constituents that are the smallest discrete objects and plenum that is substantive and continuous. Their properties dictate their interaction. Hods warp plenum (like "space") and plenum directs hods trajectory (GR and Bohm Interpretation of QM) by the $\vec{\nabla}\rho$ where ρ is the plenum density. All the hods, Sources and Sinks in the universe determine the ρ at a point like Mach suggests. Particles (matter) are an assembly of hods and the plenum that the hods drag with them (captive plenum).

The word "space" is defined in many different contexts and meanings that are confusing and unfortunate. One is as a backdrop for matter to play its role in the universe. This is used to define distance. GR uses space more like the gravitational ether. That is, a substance that can impose a force on matter to direct its trajectory with a backdrop mode to determine distance. The STOE uses "plenum" to be the substance of the universe that directs matter and that has the property of inertia. This leaves the issue of distance with the number of hod diameters in the plenum between objects rather than a ill defined backdrop. Plenum density is the amount of plenum in a volume defined by hod diameters. Practically, the STOE currently uses the traditional measures of the backdrop method where another method is not required (the redshift study was one such case where special ρ action converted distance so that the backdrop measures could be used).

A particle model of light is needed to refute QM. Therefore, the Newtonian/GR view may become the TOE. Many papers (years) ago - the need was to form a basic model to address QM in everyday terms - wave or particle. A single model of light has remained a mystery. Yet such a model is at the core of a model of the small. Black body radiation, the photoelectric effect, and the

Compton effect observations reject the wave-in-space model of light. The reflection, diffraction, interference, polarization, and spectrographic observations reject the traditional particle model of light. To refute QM, either (1) a wave model of the Black body radiation, the photoelectric effect, or the Compton effect needed to be developed or (2) a particle model of reflection, diffraction, interference, polarization, or spectrographic effects needed to be developed using GR and Newtonian scale assumptions.

One of the core pillars of QM is Young's Experiment and a model of the nature of light. The STOE model was developed in several papers to explain Young's Experiment by a computer simulation model of the photons trajectory.

This paper lists the many assumptions used in the computer simulation over several papers in Section 2. The Discussion and conclusion is in Section 3.

2 Observations specific to the STOE simulation of light

The following is a list of the STOE interpreted experimental observations used to develop the model of light and the equations for the computer simulation of Young's Experiment. They present some major differences relative to the standard model of light. However, they have analogies to the big scale or to the Newtonian scale and they are all needed to form the particle model that has experimentally shown to demonstrate diffraction.

(1) The speed of gravity (speed of a plenum) wave is finite and $>> c$ (van Flandern 1998). This is not the speed of what has been called "information". Our instruments and we sense hods and only indirectly the plenum.

(2) The plenum supports wave action. Consider an oscillating string or pendulum. At maximum swing, the pendulum has minimum kinetic energy and maximum potential energy. At the stable point, the pendulum has minimum potential energy. If it is waving it also has maximum kinetic energy so it continues its swing beyond the stable point. Next consider the gravity caused by a mass. If the only effect present is a 1/r potential, the potential at a point would decline to the 1/r point and remain. If the mass moved, the potential would change to the new 1/r potential. There would be no over–correction. Therefore, the concept that the plenum (gravity) behaves as a wave implies there is an over–correction that is propagated in addition to the 1/r potential. This ability is because the plenum has inertia. The characteristic of a wave in the plenum replaces the Huygens–Fresnel assumptions.

(3) Gravity affects the 2 dimensional hods in proportion to the surface area presented to the $\vec{\nabla}\rho$. Following Lorentz the speed of light is the fastest that any matter can travel because it presents zero surface to the $\vec{\nabla}\rho$.

(4) The hods cause gravity in the plenum. The plenum ("space") has inertia. The hods capture an amount of plenum to form matter (mass). Therefore, there is a proportionality between gravitational mass and inertial mass if each hod holds the same amount of plenum captive in matter (Hodge 2016). The amount

of plenum captured depends on the ρ of the photon environment. This derives the Equivalence Principle.
(5) The speed of the hods and photons depend on the ρ. This is the Shapiro delay. This allows the hods to seek and find the minimum ρ in the plenum wave. Hence, the hods occupy a discrete distance of the number of wavelengths from other hods that is the quantum effect. The hods then become bound to other hods in a three dimensional structure. This is the "extent" characteristic of matter.
(6) Each hod that presents zero cross section to the direction of movement loweres the ρ. When the hod passes a point, the ρ oscillates. A photon is a column of hods. The secondary peaks of the diffraction effect show a spectrographic character. Thus, the diffraction depends on the energy of the photon that depends on the number of hods in the column. Therefore, the diffraction equation originates with the photon in analogy to a linear array of dipole antennas.
(7) "Observation" (measurement) is the action of the hods on other hods (matter) in sensing instruments. There is not "action–at–a–distance". Hods cause gravity (plenum) waves by direct contact and the plenum causes the hods to move by direct contact. The speed of the plenum wave causes the "entanglement" observations through wave resonance interactions (the Newtonian scale analogy).
(8) Because the plenum is ubiquitous, there is no such thing as an "isolated system".
(9) Like water waves approaching an island, when the plenum waves approach a minimum ρ around matter, the wave is reflected with a phase shift. The Transactional Interpretation (TI) is not a time–reversed wave but a very fast, emitted wave from the matter to be reflected back by matter to the source. Because the frequency is the same as the emitted wave, a standing wave is produced. The photon moves a small distance so that the standing wave directs the path of the photon depending on the surface area exposed to the $\vec{\nabla}\rho$. This is the action of the "walking drop" (Bush 2015), also.
(10) Reflection is also off all matter including observers. This is the origin of the "wave function collapse" (or similar models) in QM. Unlike QM, the STOE model has analogies in the Newtonian scale. The wires in the Afshar (Afshar 2005; Afshar et al. 2007) experiment have very low surface area that cause little effect.
(11) Many NFLs are used to control parameters. For example, the speed of a photon is controlled by the ρ which keeps the photon in the local minima in the plenum. Computer programs with a huge number of iterations such as this simulation will become unstable without NFLs.
(12) The most problematic assumption is the equation governing the flow of the plenum. If the plenum has inertia, there is a possibility to treat the force exerted by the plenum as a fluid flow with a gradient term plus a time derivative term. The analysis of rotation curves suggested that the time derivative is either zero or is proportional to the gradient. Therefore, gravity potential is only $1/r$ dependent. The STOE separated the inertia into two parts. One part was the plenum captured by the hods. This inertia moved with the hod because the

force holding the plenum is greater than the gradient force. This part of inertia then resists motion, as does the hod. The second part of inertia in resisting hod motion was assumed to be the substantive plenum moving around the photon and is proportional to the velocity of matter rather than velocity squared which would imply turbulence. The second part becomes negligible on larger scales.

Why is the screen display of Young's Experiment indistinguishable between a Fraunhofer (Fresnel, Sommerfield) wave through the slit model and the STOE model of a particle through the slit? Because the derivation of the force field directing the photon includes the Fraunhofer (Fresnel, Somerfield) model with the Huygens–Fresnel assumptions replaced by the characteristics of a reflected plenum wave. The photon emits a plenum wave. The effect at the photon is a reflected wave from a plane minus the contribution of a reflected wave from a virtual mask atoms in the slit. The reflected wave from a plane has been developed in antenna models. It is as if the same source is perpendicular and equidistant from the plane. Its effect is to direct the photon forward. This limits the angel the photon may be diverted as it leaves the slit unlike the wave model. The virtual reflected wave (180 degree phase shift negates the minus sign and corresponds to the obliquity factor) from the slit then forms the force field with the same math as the Fraunhofer pattern.

3 Discussion and conclusion

The STOE simulation of Young's Experiment considers the photon causes waves in the plenum that are reflected by matter to direct the photon as General Relativity suggests. Consequently, any matter introduced into the experiment looks like the quantum mechanics experimenter's induced changes such as wires in Afshar experiment, measuring equipment, extra screens, or masks.

Figure 5.c of Bush (2015) for "walking drops" and Fig. 1 of Hodge (2015b) for photons have a very similar appearance.

The advantage of the STOE is that it is one model of the big of GR, the Newtonian scale, and the small of light.

The STOE is more intuitive because it postulates the universe is one and therefore, the Newtonian scale has analogies at the scale of the Big and small. The STOE corresponds to both GR and QM with appropriate simplifying assumptions. Further, it explains many problematical observations.

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