STOE model of voids in cosmology, charge, point particles, and atomic spectra

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Abstract

The Scalar Theory of Everything (STOE) model of the universe has suggested that the small world has classical analogies that account for quantum effects and that there are only two components of the universe. Therefore, the characteristic of the plenum, hods, and their interactions must yield all the observed effects. The STOE is extended to speculate about other observations. The "voids" in the large-scale structure of the universe are explained in terms of hod magnetism. The characteristics of turbulent flow vortices in the plenum describe charge. Models that suggest a point particle are describing the Newtonian Spherical property of the plenum rather than a physical dimension of particles. This yields the equation similarity between charge force and gravity force. The atomic line spectra of particle photons result from electrons in plenum troughs. The weird quantum postulates are unnecessary to explain the small-scale.

keywords: Charge, Newtonian Spherical Property, atomic spectra, STOE

1 INTRODUCTION

The Scalar Theory Of Everything (STOE) was developed to model cosmological problems (Hodge 2015d). Hodge (2004) posited the universe was composed of two components and their interaction. The plenum is a continuous medium like the ether or the "space" of general relativity. The plenum causes the inertial mass observations. The hods were two dimensional round surfaces that maintained a plenum density ρ at its surface. A hod induced a discontinuity, flat surface in the plenum. Hods cause the gravitational mass observations. The ρ at the hod surface acts perpendicular to the surface. A property of the plenum is that the plenum, like a fluid, flows from volumes of higher ρ to lower ρ. The equipotential ρ surfaces then are adjacent to the hod surface vary linearly with distance from the hod and become oval then spherical. This is the result of the plenum having the Newtonian spherical property (Hodge 2004, section II.B.2). That is the plenum potential from the hod is isotropic beyond some distance.

This spherical property implies that the force of $\vec{\nabla}\rho$ can be considered to act at the center of mass point and the plenum density ρ from the surface of the hod obeys the inverse radius law where each equipotential surface has the same total plenum potential over the total equipotential surface.

The plenum waves travel much faster than light. The hods are discrete and tended to travel in straight (Euclidean geometry) paths at the velocity of light through the plenum. The $\vec{\nabla}\rho$ exerts a force on the hod surface that changes the direction of the hod. The ρ at any point is determined by the sum of the effects of all Sources (spiral galaxies), Sinks (elliptical galaxies), and hods in the universe. The varying ρ environment causes the distance between hods in a photon to change. Emergent theory suggests all observations must derive from the characteristics of the components (Hodge 2016c).

The fractal and one–universe principles are a corollary of the Reality Principle (Hodge 2016a). All the mathematics of the models have their analogy in our everyday life (Hodge 2015d). Hodge (2015c, and references therein) expanded on the hod and plenum interaction and particle formation by describing the photon and positing the interaction of the hods and plenum. The characteristics of the plenum, hods, and their interactions have been used to derive the STOE particle[1] photon diffraction model (Hodge 2012). This photon model and a simulation program were developed to yield a diffraction pattern after random particle photons moved a large distance that simulated coherence of light. The computer program involved several iterations, which raises the specter of chaos. However, chaos is avoided by having several feedback conditions that are also in nature. Passing the photons through a slit and matching the screen pattern to a Fraunhofer pattern demonstrated coherence. This model suggested an experiment (Hodge Experiment) involving the varying illumination of coherent light across a slit. The prediction was found to be consistent with the Hodge Experiment. The Hodge Experiment rejected all wave models of light.

The photon model was extended to model neutrinos and electrons in the Stern–Gerlach Experiment (Hodge 2016b). The magnetic observation is a characteristic of hods. The photon column is similar to a bar magnetic (Fig. 1) where the disc magnets simulate the hods. The neutrinos Fig. 2 are a stable structure of photons. The structures are held together by the magnetic properties of the hods. Other structures are possible but are less stable or shorter lived. Likewise, electrons are assemblies of neutrinos. The orientations of magnetic poles explain the observations of electrons in the Stern–Gerlach Experiment (Hodge 2016b). There are two such structures with the same gravitational mass (number of hods) that explains the electron and positron Fig. 3 and Fig. 4.

The direction of movement of these structures is in the direction with the least hod surface area presented. This direction for photons and neutrinos is perpendicular to the page in the figures with zero cross section. Therefore, these particles travel at the largest speed possible in the ρ environment. The electron and positron structures have a surface area presented in all directions.

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[1]A distinction is make between a wave packet type model that is called a "photon" and a particle type model.
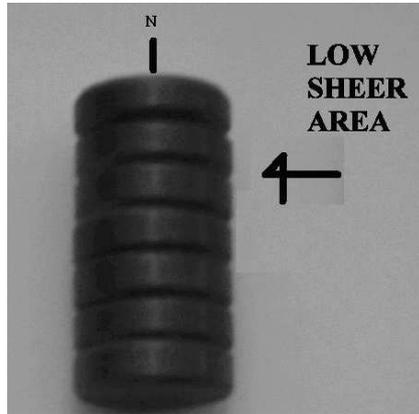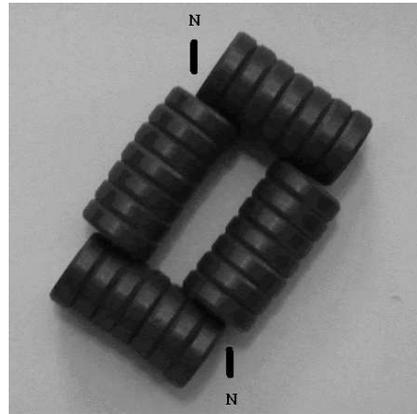
Figure 1: Photon.
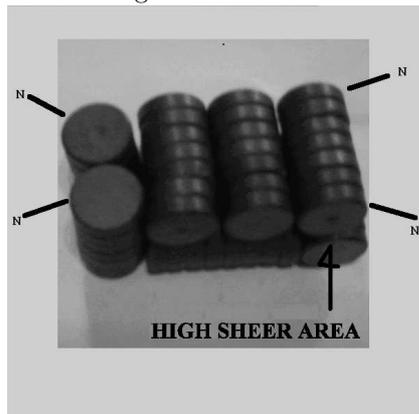

Figure 2: Neutrino.
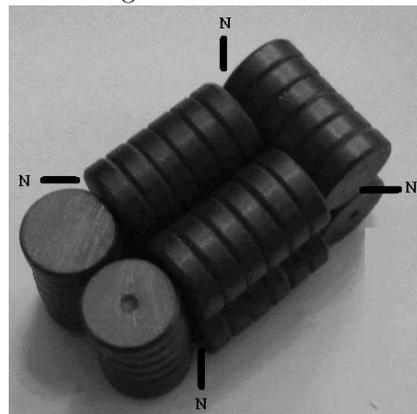

Figure 3: Structure of electron or positron.

Figure 4: Structure of electron or positron.

Therefore, they travel at less than the speed of the photon. There is a preferred orientation that, with the magnetic directions, causes the observations of the Stern–Gerlach Experiment (Hodge 2016b). This travel orientation is perpendicular to the page. The Stern–Gerlach Experiment observations would not occur without a preferred direction.

Maxwell's Equations are a description of the empirical results of several experiments of electric and magnetic phenomena. They are not an explanation of basic physics. The phenomena are commonly attributed to new hypothetical particles such as a charge, point particles, or attributes of some particles such as electrons. This model has a coulomb force law and acts at the center of mass of particles similar to gravity.

Photons, neutrons, and neutrinos have a neutral charge. Electrons, muons, tau, and quarks have charge attributes. Charges are modeled as generating a coulomb field. The velocity of an electromagnetic signal is the velocity of photons. The coulomb field velocity has been measured to be much faster than light (de Sangro 2012).

Turbulence in fluid flow past surfaces happens when the Reynolds Number is high. Turbulence is a chaotic motion caused by high sheer in the fluid. Current models described turbulence and vortices poorly. The Reynolds Number is the ratio of the kinetic, inertial energy of the fluid relative to the object, and the viscous dampening in a continuous media (fluid). Laminar flow occurs when the fluids flow in parallel layers with no disruption between the layers. Turbulent flow occurs with high Reynolds Number, in volumes with high sheer, and is dominated by inertial forces. The result of turbulent flow is unsteady vortices. The vortices interact with each other, are of varying size, and carry kinetic energy and momentum. Vortices can exist for a relatively long time such as cyclones and tornados. Inviscid flows have very high Reynolds Number. Small–scale turbulent motions are statistically isotropic. Therefore, the statistics of inviscid media, small–scale turbulent motions have a universal character. That is, the characteristics are the same for all such turbulent flows.

"Vortex stretching" is a mechanism characterized by strong three-dimensional vortex generation. The vortices have an increasing velocity in the stretching direction caused by conservation of angular momentum. The vortices are thinned in the direction perpendicular to the stretching direction. Therefore, the vortices may be right–handed or left–handed. Like handed vortices tend to repel or combine into larger vortices. Opposite handed vortices combine to cancel the angular momentum of each other. Larger vortex structures break down into smaller structures.

Atomic line spectra data are light of discrete energy levels emitted and absorbed by atoms. The Hodge Experiment rejects the wave models of this emission.

The classical analog of the walking drop experiments exhibit quantum-like observations (Bush 2015a,b; Borghesi 2017a,b). This analogy was noted in the Hodge Experiment (Hodge 2015c).

This Paper expands the STOE model. The model of photons is discussed in section 2. The model of charge of electrons is discussed in section 3. The model
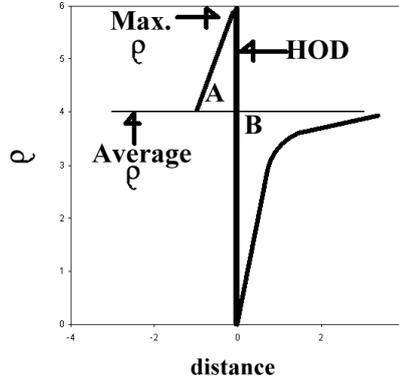
Figure 5: ρ around a hod.

of atomic line spectra is discussed in section 4. The Discussion and Conclusion are in section 5.

2   The photon model

The photon model developed by the STOE suggested the hods are magnetic. If there are only two components of the universe and if electromagnetic signals travel at the speed of light, the hods must cause the electromagnetic signals. The electromagnetic effects result from the traveling magnets inducing an electric field as they travel in accordance with Maxwell's equations. The associated coulomb field must be in the plenum because of the travel speed.

The magnetic property of hods is posited to be caused by different ρ effect on the plenum on each side of the hod as depicted in Fig. 5. The ρ varies linearly with distance close to the hod surface, then the Spherical property of the plenum causes the equipotential ρ surface to become spherical and vary with 1/distance beyond some distance. The $\rho = 0$ on one side is balanced with the universal maximum ρ on the other side. Surrounding the hod is the ρ environment (labeled "average ρ"). The speed of waves in the plenum is much greater than the speed of light (Hodge 2015c). Therefore, the cosmological horizon for plenum effects is much larger than the hod horizon.

If the area "B" in Fig. 5 is greater than the area "A", then the potential net $\vec{\nabla}\rho$ is gravitational. If the area "A" is greater than the area "B", then $\vec{\nabla}\rho$ is repulsive. The latter case may be the mechanism causing the voids (bubbles) in the large-scale, foam-like structure of the universe.

3 The charge model

If the hods account for the magnetic effects of electromagnetic observations, then the plenum accounts for the charge effects in the STOE model.

Chaotic motion is present in the classical scale and cosmological scale. The STOE suggests such motion should be present in the ultra small scale motion, also. The model of photon diffraction suggests possible chaotic effects are balanced by feedback loops.

The plenum has minimal viscosity. Therefore, the plenum has a very high Reynolds Number. The particles of proton and neutrino structure have laminar flow because of the zero cross section presented to the direction of travel. The alternating north pole and south pole of the hods edges have low plenum sheer because the magnetic strength is low at the hod edges (Fig. 1). The electron and positron and larger structures have some cross section presented to the direction of movement. The alternating north pole and south pole of the adjacent hods surfaces create high sheer to passing ρ and $\vec{\nabla}\rho$ (Fig. 3). Therefore, the flow is turbulent. Vortices with a right hand circulation may be from one structure and a left hand circulation from the other structure. The inertial energy carried by the vortices manifest as an increase of the ρ around the vortices.

The vortices in very high Reynolds Number and in high sheer environments become isotropic after some length L scale such as the width of a nucleus. Therefore, particles that generate like vortices may exist within this length scale such as within the nucleus.

Vortices beyond L of a like rotation tend to increase ρ that then acts on the particles to repulse them. Vortices of opposite rotation combine to cancel the rotational inertial kinetic energy. This lowers the ρ between the particles. That is the particles are attracted to each other.

4 Atomic line spectra

Electrons in a field without charge will travel in plenum troughs in material. This suggests a speculation that super conduction may be such an effect. Because the vortices require L to become isotropic, electrons may exist close to each other such as in a nucleus. The nucleus is a gravitational sink in the plenum. This creates concentric waves with troughs in the plenum that are arranged in step increments. Walking drops show a similar arrangement (Bush 2015a, Fig. 1.(b)). The $\vec{\nabla}\rho$ change is small in the troughs around the nucleus. Electrons may travel around in these troughs without release of energy. The trough $\vec{\nabla}\rho$ in the radial direction holds the electron in the trough. The size of the nucleus determines the spacing and depth of the troughs. A further speculation is that the magnetic fields attracts and holds particle photons between the electrons and nucleus. The electrons are held in place by the troughs radially and the photons are not rotating around the nucleus. The troughs farther from the nucleus attract more hods to make higher energy photons. The electrons are also a mass that depresses the ρ in the trough. That is, there is a minimum

limit on how far apart the electrons can be (Bush 2015a, Fig. 1.(f) and Fig. 4.). Therefore, several electrons can be in ther same nuclear trough. Electron changing trough This accounts for the required absorption and emission of photons with spectra characteristics.

5   Discussion and Conclusion

The goal is to build a self-consistent model of the universe. Poorly explained observations by other models are part of the STOE. The STOE suggested models of mysterious cosmology observations Hodge (2010).

What kind of experiment yet to be done could distinguish the STOE model from other models? Maxwell's equations are not models. The STOE suggests charge is the result of the $\vec{\nabla}\rho$ environment. The charge is the vortices in the plenum. Therefore, the effect of charge should decrease with decreasing motion or less $\vec{\nabla}\rho$. The spacing of the troughs and the number of electrons in the orbits may provide dimensions for the induced plenum waves.

The Scalar Theory of Everything (STOE) model of the universe has suggested that the small world has classical analogies that account for quantum effects and that there are only two components of the universe. Therefore, the characteristic of the plenum, hods, and their interactions must yield all the observed effects. The STOE was extended to speculate about other mysterious observations. The "voids" in the large-scale structure of the universe are explained in terms of hod magnetism. The characteristics of turbulent flow vortices describe charge. Models that suggest a point particle are describing the Newtonian Spherical property of the plenum rather than a physical dimension of particles. This yields the equation similarity between charge force and gravity force. The atomic line spectra of particle photons result from electrons in plenum troughs. The weird quantum postulates are unnecessary to explain the small-scale.

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