

# STOE plenum is real

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## Abstract

The “plenum” in the Scalar Theory of Everything (STOE) is the component of the universe that is a continuous medium that interacts with matter particles. Because a medium is not directly detected in instruments, the question of its reality is controversial. This is linked with the question of whether quantum waves are real waves in the plenum or merely probability waves. The experiment to demonstrate the reality of the plenum as a component of the universe has been done. The conclusion is that the plenum is a real component of the universe.

keywords: aether, plenum, STOE.

## 1 Introduction

The ontology of the existence of a continuous medium that transmits changes such as waves has been a subject of interest whether discussing an aether or quantum waves. This is an issue primarily in Quantum Mechanics where waves may be real or merely probability calculations.

The Scalar Theory of Everything (STOE) suggests a causation model using a continuous plenum medium to cause forces on matter and hods which in turn cause the plenum to change [Hodge 2016, 2020]. The “walking drop” experiments appear to be hydrodynamic analogs of quantum mechanics at the macro level. The De Broglie Pilot wave hypothesis suggests the waves and

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their medium are ontologically real and independent of an observer. These are called the “empty waves” (meaning real waves without matter) or “de Broglie waves”.

“Matter” in the STOE are corpuscles NOT de Broglie’s other quantum wave packets. The distinction is that our detectors measure the matter (STOE hods) and not the empty waves (STOE plenum).

The popular Copenhagen Interpretation of QM suggests the waves are merely probability, mathematical waves and are NOT real. De Broglie, Bohm, and now Hodge in the STOE suggest the waves are in a real medium. However, the STOE has the additional suggestion that the hod is also discrete - that is, not a high-energy kernel of a wave which is a singularity usually detected in quantum experiments. The Copenhagen Interpretation suggests light is a wave OR a particle. The STOE suggests light effects such as interference are due to a wave in the plenum AND a particle which causes the wave [Hodge 2012].

Croca et al. [2022] proposed several experiments to support the reality of the empty wave using Copenhagen Interpretation math. The perceived problem is to have an experiment that is not explainable in the Copenhagen Interpretation. They use several photons that may be treated as “bi-photons” (entangled such that they are calculated as one wave function).

The other effect that must be accounted is the “Hong-Ou-Mandel (HOM) effect demonstrated in an experiment by Alain Aspect where photons appear (are) coherent when emitted by a beam splitter. The STOE suggests the photons in a laser beam are coherent in the sense of this effect[Hodge 2012]. But this effect is discounted when the optical path lengths differ and a beam splitter is not used.

This paper shows the experiment [Hodge 2019] to support the STOE model of a ontologically, physically real plenum (aether) and hods(matter). That is, the plenum wave (empty wave) of a photon (coherent light – laser) is detected without additional photons by the difference between diffracted and interference of light on a screen pattern.

## 2 The experiment

The STOE model of a photon laser light need not have a Mandel dip which is necessary in Croca’s context, because the STOE experiment Hodge [2019] has only 1 optical path for each photon. Whether laser light is a series of

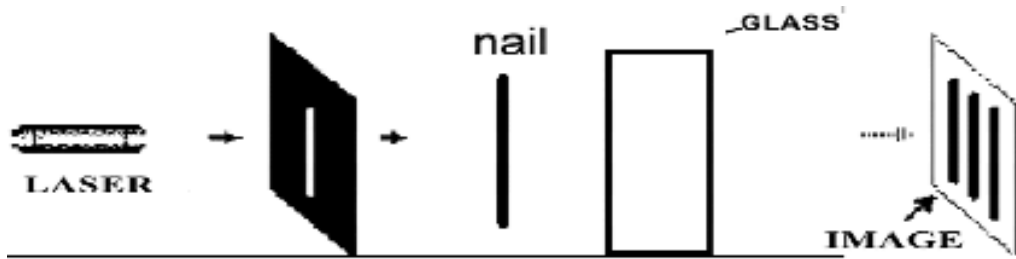


Figure 1: Diagram showing the experimental layout for the “without slit” pattern in Fig. 3.

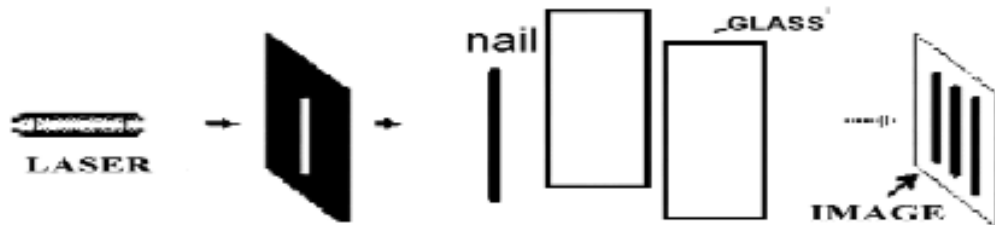


Figure 2: Diagram showing the experimental layout for the “with slit” pattern in Fig. 3.

single coherent photons in low intensity experiments or a group of photons as Mendal dip suggests is irrelevant. Neither is modeling a quantum particle or bi-particle necessary. All that is needed is that laser light thru slits produce diffraction and interference patterns. This experiment also rejects Copenhagen.

The last setup in Hodge [2019] is the start of this paper as shown in Fig. 1. This produces the diffraction pattern shown in Fig. 3 labeled “without slit”. This is the diffraction pattern of Hodge [2019, Fig. 3 b] with the addition of a nail blocking the central peak.

The second image for comparison is obtained by the setup shown in Fig. 2. This produces the interference pattern shown in Fig. 3 labeled “with slit”. This is the interference pattern of Hodge [2019, Fig. 3 d] with the nail blocking the central peak.

As in Hodge [2019], the slit in the glass plate is necessary to form the interference image without light passing through the slit. Figure 4 depicts

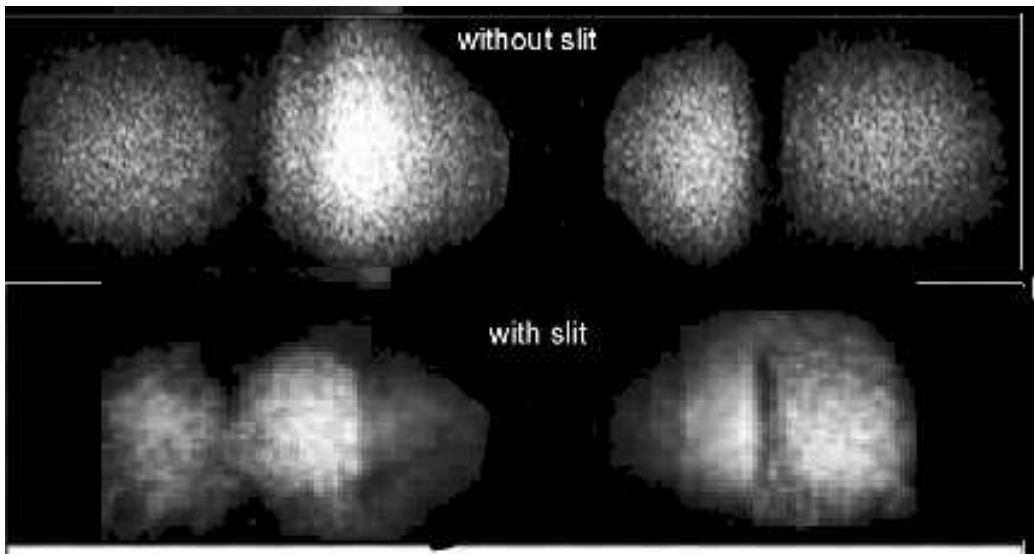


Figure 3: Photographs in 2 color showing the screen image of with a slit and without a slit.

the situation. The pattern before the glass mask is a diffraction pattern from the first mask Hodge [2019, Fig. 3 a]. The photon between the glass mask and the screen has been influenced by the presents of the slit in the glass plate after it has passed through the glass. This suggests a causative link [Hodge 2022] wherein the physical characteristic (width) of the slit has modified the path of the photon into an interference pattern. The screen pattern is real, the light is real, and therefore the “link” that changes the photon path is real.

### 3 Conclusion

Because a medium is not directly detected in instruments, the question of its reality is controversial. This is linked with the question of whether quantum waves are real waves in the plenum or merely probability waves. The experiment to demonstrate the reality of the plenum as a component of the universe has been done. The conclusion is that the plenum is a real component of the universe.

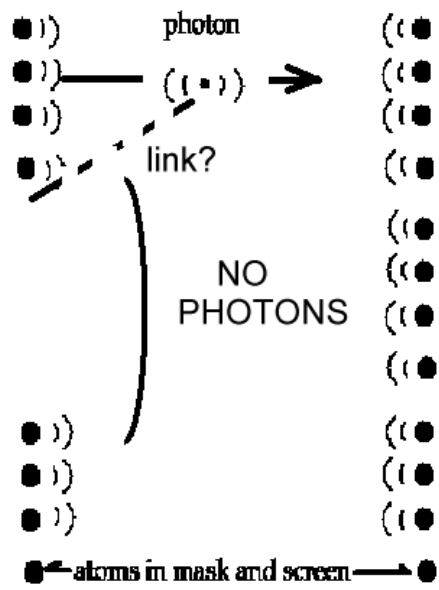


Figure 4: Diagram depicting the path of the photon relative to the slit.

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