SCHEMATIC APPARATUS FOR DETECTING THE SHRINKAGE OF MATTER

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This device is based in the SMTwVSL (Shrinking Matter Theory with Variable Speed of Light)(1). This is an answer to the most challenging question that can be asked about a theory, which is: How can we test this theory?

In this case, we can ask:

How may one test if matter shrinks or not?

How can one test whether matter shrinks or not?

The device for detecting matter shrinkage must be based on interferometry technology.

The arrangement of the apparatus is similar to the old “Michelson-Morley experiment”, but the mirrors are replaced by optical fibers with another beam splitter to join the two beams from the first beam splitter. The introduction of new technologies in the production of the coherent laser beam, in the phase and polarization control and in the photodetector is essential for the proper functioning of the equipment. A room with strict temperature control is required.

The large difference in the length of the two optical fiber results in a build-up of photons inside the larger optical fiber. The shrinking of the optical fiber and wavelength at different rates, combined with the increasing light speed, result in a decreasing in the accumulation of photons, changing the interference pattern in the output of the second beam splitter.

The length of the large optical fiber was adjusted in this project to give one phase-shift in 360 days, to simplify the analysis, resulting in a phase shift rate of one arc grad per day.

Here we have the “schematic apparatus for detecting the shrinkage of matter”.

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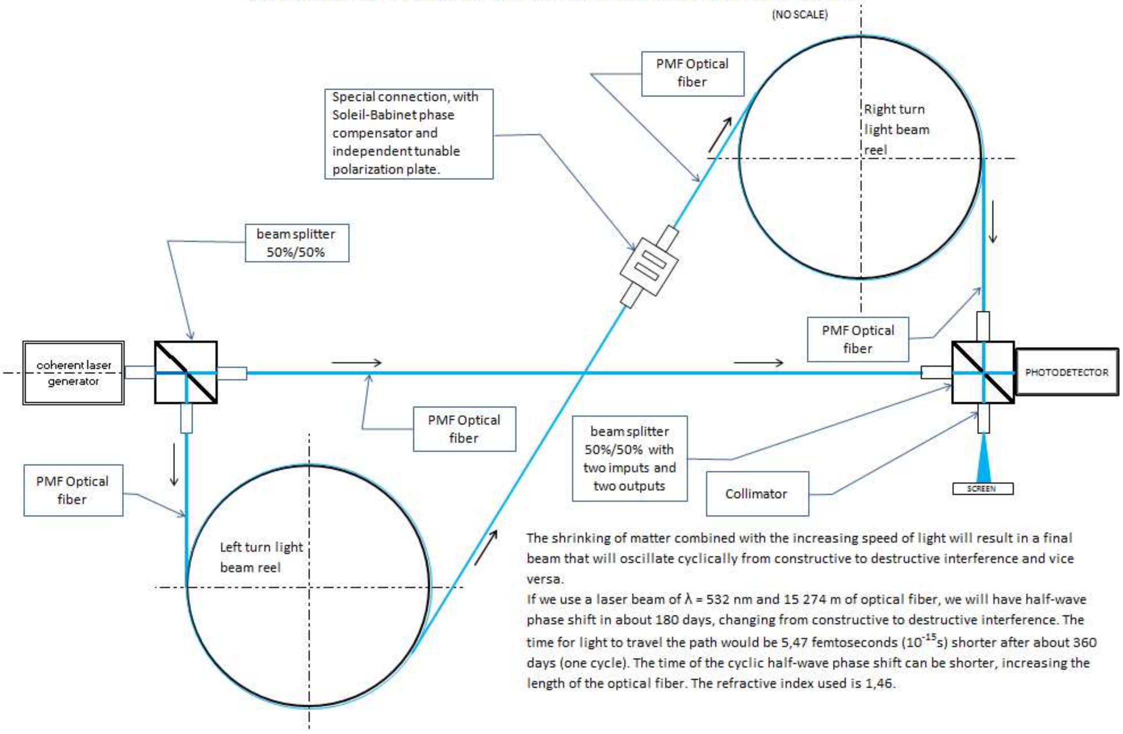
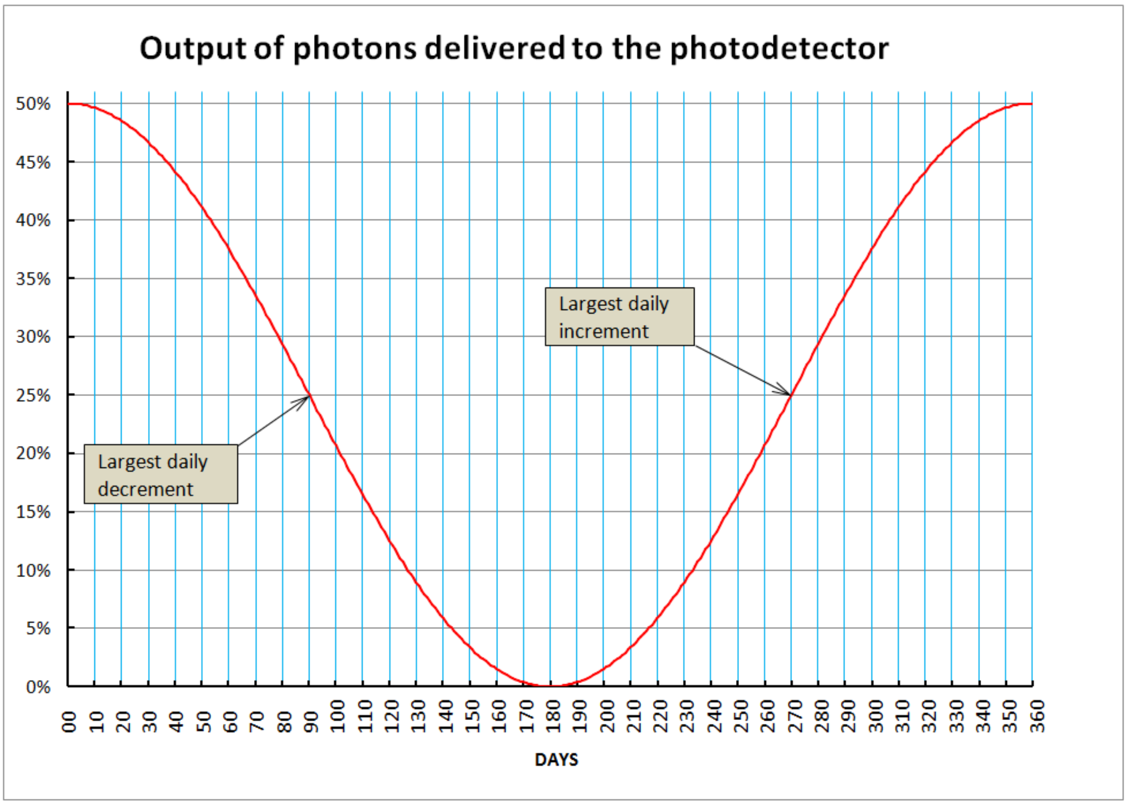


The shrinking of matter combined with the increasing speed of light will result in a final beam that will oscillate cyclically from constructive to destructive interference and vice versa.

If we use a laser beam of λ = 532 nm and 15 274 m of optical fiber, we will have half-wave phase shift in about 180 days, changing from constructive to destructive interference. The time for light to travel the path would be 5,47 femtoseconds (10^{-15}s) shorter after about 360 days (one cycle). The time of the cyclic half-wave phase shift can be shorter, increasing the length of the optical fiber. The refractive index used is 1,46.



To take fast results we could adjust the phase compensator to obtain the largest day decrement, with measurable results in one day. The change in the largest daily decrement position is about 0,87% per day.

It is worth noting that this result is dependent on the Hubble constant. The constant “K_A” is proportional to the inverse of the Planck constant (h^{-1}), so this device would serve to definitively end the eternal tension of this constant, which in any case would no longer be used.

This apparatus can detect the shrinkage of matter at any rate it occurs. If the shrinkage does not happen, the amount of photons delivered to the photodetector will be constant at any time.

Formulae table for Shrinking Matter Theory with Variable Speed of Light (SMTwVSL)

Symbol	Basic equation	SMTwVSL formulae: Variation in functio of Z	SMTwVSL formulae: Variation in function of t	Variation rate per year at present	
c (m/s)	$c = \frac{1}{\sqrt{\varepsilon_0 \mu_0}}$ [11]	$c_{(f)} = c_{(0)}(1+Z)^{-1/3}$	$c_{(f)} = c_{(0)}\left[\frac{t+K_A}{K_A}\right]^{-1/2}$	past future	-2,420 419 420 445 80E-11 2,420 419 420 445 80E-11
Z	$Z = \frac{\lambda_{obsv} - \lambda_{emit}}{\lambda_{emit}}$ [15]	----------	$Z = \left[\frac{t+K_A}{K_A}\right]^{3/2} - 1$	past future	7,261 258 261 337 39E-11 -7,261 258 261 337 39E-11
t (Gyr)	----------	$t_{(f)} = K_{(A)}[(1+Z)^{2/3}-1]$	----------	----- -----	---------- ----------
D (Gly)	----------	$D_{(f)} = 2K_{(A)}[(1+Z)^{1/3}-1]$	$D_{(f)} = 2K_{(A)}\left\{\left[\frac{t+K_A}{K_A}\right]^{1/2} - 1\right\}$	----- -----	---------- ----------
r (m)	$r_n = \frac{n^2 \hbar^2}{Z k_e e^2 m_e}$ [10]	$r_{(f)} = r_{(0)}(1+Z)^{2/3}$	$r_{(f)} = r_{(0)}\left[\frac{t+K_A}{K_A}\right]$	past future	4,840 838 840 891 59E-11 -4,840 838 840 891 59E-11
λ (m)	c / ν [10]	$\lambda_{(f)} = \lambda_{(0)}(1+Z)$	$\lambda_{(f)} = \lambda_{(0)}\left[\frac{t+K_A}{K_A}\right]^{3/2}$	past future	7,261 258 261 337 39E-11 -7,261 258 261 337 39E-11
ν (Hz)	c / λ [10]	$\nu_{(f)} = \nu_{(0)}(1+Z)^{-4/3}$	$\nu_{(f)} = \nu_{(0)}\left[\frac{t+K_A}{K_A}\right]^{-2}$	past future	-9,681 677 681 783 19E-11 9,681 677 681 783 19E-11
ε_0	$\varepsilon_0 = \frac{1}{\mu_0 c^2}$ [11]	$\varepsilon_{(f)} = \varepsilon_{(0)}(1+Z)^{2/3}$	$\varepsilon_{(f)} = \varepsilon_{(0)}\frac{t+K_A}{K_A}$	past future	4,840 838 840 891 59E-11 -4,840 838 840 891 59E-11
α	$\alpha = \frac{e^2}{2h\varepsilon_0 c}$ [12]	$\alpha_{(f)} = \alpha_{(0)}(1+Z)^{-1/3}$	$\alpha_{(f)} = \alpha_{(0)}\left[\frac{t+K_A}{K_A}\right]^{-1/2}$	past future	-2,420 419 420 445 80E-11 2,420 419 420 445 80E-11
k_e	$k_e = \frac{1}{4\pi\varepsilon_0}$ [13]	$k_{e(f)} = k_{e(0)}(1+Z)^{-2/3}$	$k_{e(f)} = k_{e(0)}\left[\frac{t+K_A}{K_A}\right]^{-1}$	past future	-4,840 838 840 891 59E-11 4,840 838 840 891 59E-11
E	$E = -\frac{Z^2 (k_e e^2)^2 m_e}{2 \hbar^2 n^2}$ [10]	$E_{(f)} = E_{(0)}(1+Z)^{-4/3}$	$E_{(f)} = E_{(0)}\left[\frac{t+K_A}{K_A}\right]^{-2}$	past future	-9,681 677 681 783 19E-11 9,681 677 681 783 19E-11
σ_W	$\sigma_w = \frac{h c}{x k}$ [14]	$\sigma_{W(f)} = \sigma_{W(0)}(1+Z)^{-1/3}$	$\sigma_{w(f)} = \sigma_{w(0)}\left[\frac{t+K_A}{K_A}\right]^{-1/2}$	past future	-2,420 419 420 445 80E-11 2,420 419 420 445 80E-11
T	$T = \frac{\sigma_w}{\lambda}$ [14]	$T_{(f)} = T_{(0)}(1+Z)^{-4/3}$	$T_{(f)} = T_{(0)}\left[\frac{t+K_A}{K_A}\right]^{-2}$	past future	-9,681 677 681 783 19E-11 9,681 677 681 783 19E-11
R_∞	$\frac{1}{\lambda} = R_\infty\left(\frac{1}{n_f^2} - \frac{1}{n_i^2}\right)$ [10]	$R_{\infty(f)} = R_{\infty(0)}(1+Z)^{-1}$	$R_{\infty(f)} = R_{\infty(0)}\left[\frac{t+K_A}{K_A}\right]^{-3/2}$	past future	-7,261 258 261 337 39E-11 7,261 258 261 337 39E-11
r_s	$r_s = \frac{2 G M}{c^2}$ [16]	$r_{s(f)} = r_{s(0)}(1+Z)^{2/3}$	$r_{s(f)} = r_{s(0)}\left[\frac{t+K_A}{K_A}\right]$	past future	4,840 838 840 891 59E-11 -4,840 838 840 891 59E-11

10) Bohr_model
11) Vacuum_permittivity
12) Fine-structure_constant
13) Coulomb_constant
14) Wien displacement constant
15) Redshift
16) Black_hole

$c_{(0)}$ = 299 792 458	m/s
$K_{(A)}$ = 20.657 582 148 185 686 (h^{-1})	
h ≡ H0 = 71 km/s/mpc, already within the value	
t: (Gyr) (for future, time "t" must be negative in the formulae)	

References:

1. da Mota Filho, Azor Romão. https://vixra.org/abs/2205.0001. https://vixra.org. [Online] 30 de 10 de 2023.