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Github: <https://github.com/d3x0r>

Github Repository relevant for paper: <https://github.com/d3x0r/STFRPhysics>

This project was started as a curiosity for what a body that traveled faster than the speed of light might appear like. It is worth noting that other than in some warp bubble that allows some space to move within the greater mass of space, this would not be possible, because matter cannot go faster than light. It is also likely that there is a sort of friction for matter moving through space that prevents it from even getting very close to the speed of light.

The general math for the propagation of light, whether it is considered waves or photons, is the same for any speed of light, except when the velocity of a body is exactly equal to the speed of light, and there is a special case solution for this case, where the velocity is used in the calculation instead of the speed of light, which since they would be the same is valid.

After developing a few demonstrations for various scenarios:

* an observed object passing a stationary observer
* an observer passing a stationary object
* an observer moving with an object at some velocity
* adding a direction to the observer traveling with an observed object
* expanding to a 2D plane moving relatively to another plane, each with their own speed and direction

Then I considered length contraction. Since the time it takes for light to go forward and backward in a two-way path along the direction of the velocity was longer than the time it took to travel horizontally, and knowing that an interferometer produces a null result, I considered this might be a real thing. I thought I saw a note that Oliver Heaviside has observed such a contraction in a moving cloud of charged particles, but it might have just been in the math of a moving cloud of charged particles. Regardless, normalizing the time it takes for light to travel a two-way path forward and backward along the velocity, to the time it takes to travel laterally revealed a length contraction of , which is the reciprocal of Einsteins gamma factor, it was somewhat of a confirmation that I was on the right path. The length contraction then makes the two-way travel time in any direction the same in any direction.

Then, I considered the time dilation factor, which turned out to be time contraction, that a clock that is moving runs slower than a clock that is stationary. This is because it ends up covering more space in a certain amount of time than it would cover while stationary. The additional time it takes for a clock to tick in a contracted length also ended up being . This term as the velocity approaches the speed of light goes to 0.

I thought I was done for a while, but then I ran across something that explained that a moving body also experiences light aberration, which is an effect that advances the angle of an observed light source based on the velocity. This effect must also apply to transmitted light. I looked up some information on light aberration and implemented that in the 2D planes moving relative to each other, at least on the observer’s view of the observed 2D plane. The combination of light propagation aberrated by the speed made the lagged, longer side spread out more, and the contracted, shorter side squeeze together, in what appeared to be a manner that, if the plane was looked at in perspective, that I would have wagered that the appearance would be the same with a perspective calculation. My demos up to that point were only 2D, and a perspective calculation would result in a ring, and not being a flatlander, I would have problems interpreting just a ring of perspective. I have a 3D Voxel engine I am building, which I realized I could implement the light propagation, length contraction, and light aberration as factors in the shader, and then apply an orthographic and perspective camera to the resulting mesh. When the speed and direction of the moving body and observer on the body are the same, the body always looks the same as it would if stationary; although there is a color hue shift of 1ns per meter, and light travels approximately 1 foot in 1ns, so the color changes from red to green to blue and back to red every 3 nanoseconds approximately; so if you were able to see something that changed color at the speed of nanoseconds, you could see a difference between being stationary and moving.

I’ve tried to have reasonable conversations about this in various places, but many of the observations I would expect special relativity to also show are not there, and then I look the fool, and everyone else feels so much smarter. I’m somewhat surprised that this hasn’t already been presented as an alternative to Special Relativity, since there are obviously problems with Special Relativity like The Twin Paradox for one.

An interferometer, such as the Michelson-Morley experiment, or as used for LIGO, which is tuned for destructive interference in a natural state, has a null result with this math also. One of the last demos I did was an interferometer, which also helped me calculate relativistic doppler shift. The resulting equation I have for doppler shift is different than Einsteins though, but near the speed the solar system is travelling through the universe is only off by a factor of 1 in a million or so. There is a Transverse Doppler Effect which, with my math, would predict 0 frequency shift, while there is a red/blue shift from Einstein’s math. ( <https://en.wikipedia.org/wiki/Relativistic_Doppler_effect> ).

Some other differences between this approach and Special Relativity:

* The math for this is more complex.
* Space does not contract, only a moving body contracts, and space does not move.
* If space did move, it wouldn’t matter a lot- other than the effective maximum speed you could go against the motion of space would be less than the speed of light.
* There is an anisotropic speed of light one can detect. It’s a simple experiment to figure this out, but certainly only something we can do with modern technology. I plan on doing it myself, since the reaction to such an experiment is “nonsense!”.

Links to Demos mentioned:

* <https://github.com/d3x0r/STFRPhysics> - Git repository with all demos, and some additional documentation.
* <https://d3x0r.github.io/STFRPhysics/math/indexLightSpeed1.html> - moving object, stationary observer.
* <https://d3x0r.github.io/STFRPhysics/math/indexLightSpeed2a.html> - moving observer, stationary object.
* <https://d3x0r.github.io/STFRPhysics/math/indexLightSpeed3.html> - moving observer on a moving object.
* <https://d3x0r.github.io/STFRPhysics/math/indexLightSpeed4.html> - moving observer, on a moving object, can also change the direction of motion.
* <https://d3x0r.github.io/STFRPhysics/math/indexLightSpeed3b.html> - two moving 2D spaces, with square bodies, instead of just a body that’s a line.
* <https://d3x0r.github.io/Voxelarium.js/index2-dual-view.html> - perspective test
* <http://d3x0r.github.io/STFRPhysics/math/indexLightSpeed-Clocks.html> – misc. test testing what times are seen on clocks from various places, comparison of relative viewpoints.
* <http://d3x0r.github.io/STFRPhysics/math/indexInterferometer4.html> - interferometer, implementing transmission/reception light aberration, and length contraction. Direction of motion can be changed.