Correspondence

Light and Gravity Aberration, Ether-Wind Detection

This journal has seen ongoing discussion of the effects that gravitational aberration would produce, assuming that it indeed exists. (See [1], [2], plus the historical references [3], [4].) Much of the discussion assumes a similarity between gravity and light that the present author finds too strong. Recognizing more of a distinction between gravity and light could resolve a lot of controversy and move us forward to more productive technology for ether-wind detection.

Aberration of Light

Light is a **dynamic** field and must be treated as a moving object. Aberration of light is therefore a consequence of the observer's motion transverse to light's direction of propagation. In a planetary system, this means the difference in velocity between observer and source. For very distant sources, only **change** in velocity is relevant for the **observable** part of aberration. When light is treated like a moving object we cannot use aberration to rule out Einstein's theory. Paul Marmet has demonstrated compatibility with Einstein's theory if the detector's velocity is relative to the light *per se* (not the source) [5].

Aberration of light is just an effect of a Galilean coordinate transformation of velocities. It is independent of whether we consider light to be particles or wave motions. The aberration is the same for an autonomous as well as for an entrained (or 'generated' ether, according to the late Petr Beckmann, relative to the gravitational field [3]). When light moves from Sun-generated to Earth-generated ether, the wave front normal is conserved. This is a consequence of light being a transverse oscillation. In a new ether neighborhood, only longitudinal adaptation (speed) takes place. As a consequence, stellar aberration is silent about the ether model as well as the light model.

If light adapts to ether only in one dimension, this fact could perhaps create problems for existing ideas to detect ether drift by means of high precision speckle photography: if transverse adaptation exists, it exists in the laser too.

Aberration of Gravity

The gravitational field is **static** in relation to its source. Only changes move with finite speed (probably c), and the observer's velocity is irrelevant for aberration in a static field. In the case of a large mass and a small mass, such as Sun and Earth, we cannot see any aberration due to their orbiting. Gravitational aberration must therefore be calculated in a way different from aberration of light.

The perturbation of the Sun's motion is dominated by the contribution from Jupiter, the heaviest planet. For Jupiter v/c is 0.44×10^{-4}, which defines its angular motion during the time of transit for gravity. The mass ratio between Jupiter and Sun is about 10^{-3}, and therefore the Sun's motion is $v/c = 0.44\times10^{-7}$, which also defines the aberration angle of gravity from the Sun. This means that aberration of gravity from the Sun is 2200 times smaller than that of light ($v/c = 10^{-4}$). This value would become even smaller if the effect of all planets were considered. Besides, this kind of aberration varies with time according to a sine function, and has a mean value of zero. It therefore cannot be detected, and causes **no** expansion of planetary orbits. This demonstrates that we can assume light-speed gravity **without** implying expansion of planetary orbits.

No gravitational aberration from the Earth's velocity exists, and the effect from Jupiter moving the Sun is too small to be detected. P. Gerber [4] and P. Beckmann [3] were both right about the possibility of light speed of a gravitational change. G.D. Ransford's calculations according to [2] and [6] seems to be missing the important distinction: Gravity is stationary with respect to its source, but light is moving with respect to its source. Therefore gravitational aberration is an effect of a moving source only. Gerber's idea of light speed and gravity is an adjustment to Newton's theory. [2] If Ockham's Razor had been considered, Gerber's theory would have been tested **before** Einstein's more complex theory.

Detecting an Ether Wind

The Michelson-Morley method uses a dynamic field moving back and forth between mirrors. The ether is supposed to change the fields in such a way that the wavelength increases in one direction of travel and decreases in the other. These effects almost compensate each other, but a very small second order term in total number of wavelengths (back and forth) remains.

In a crystal, static fields define the separation between two atoms: one atom is positioned in the field of the other. The generated forces are zero at a certain separation. The ether affects the fields in such a way that one field will increase separation and the other will decrease it. When the forces are canceled, the separation is not really canceled; a small second order term remains. The separation-defining fields react to the ether wind in the same way as the measuring field between the mirrors. This means that the ether-wind's effect on the measuring field is **exactly** compensated by mechanical contraction. This explains the Michelson-Morley null-result, and means that Fitzgerald's contraction is a fact. The Michelson/ Sagnac dichotomy can now be explained by second/first order detection (instead of by translation/rotation).

Conclusions

Stellar aberration is just an effect of a coordinate transformation and therefore silent about an ether model.

Gravitational aberration is too small to be observed and has no relevance for detecting ether wind.

Detecting the ether-wind by the use of **second order** effects is impossible. The translational motion of the ether must be detected based on **first order** effects. Such a method, based on microwaves, is described in [7]. For higher precision, this idea could perhaps be transformed to the optical region.

References

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