

The Wave Medium, the Electron, and the Proton - Part 1

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Summary

A geometric argument is presented that the true ratio between the rest mass of the proton and the rest mass of the electron is $6\pi^5$. The deviation of the measured value for this ratio from $6\pi^5$ is interpreted to be a relativistic mass correction due to movement through the aether. This aether resembles a scalar field. Based upon the Lorentz transformation, the velocity associated with this relative motion is 0.006136 c.

Preface

The author is neither a mathematician nor a physicist. The mathematics in this work is limited to basic trigonometry. This is not a theoretical text concerning quantum mechanics. Instead, the author begins with an assumption regarding the mass ratio between the proton and the electron. The author then develops a model that is consistent with the assumption.

Discussion

$6\pi^5$. In April of 1951, Friedrich Lenz¹ of Düsseldorf, Germany sent a letter to Physical Review noting that the ratio of the mass of the proton to the mass of the electron is very nearly $6\pi^5$. Unfortunately, no supporting theory or reasoning was provided. Perhaps this was thought to be a coincidence. Perhaps this was thought to be unimportant. For whatever reason, this observation appears to have been either ignored, dismissed, or forgotten.

In a previous work², the author independently made the same observation concerning this ratio of particle masses. However, the author does not believe in coincidence in the physical sciences. That work concerned the use of quaternions and vector rotations to produce solutions to the wave equation. The author speculated that somehow rotation was involved and that perhaps particle mass was somehow related to string length. The observation concerning the mass ratio has been an obsession for almost a year. The author is now prepared to provide a feasible explanation for this observation.

Please refer to Figure 1 below. Similar triangles are used to project a line segment of length d onto a line segment of length πd . There is also a circle of diameter d associated with the smaller line segment but it is not visible in the sketch since it is perpendicular to the sketch. It is simple to show that $L_2/L_1 = \pi$ for this to be true. Now suppose that the projected line segment is rotated 90° in addition to being scaled by a factor of π . This is equivalent to multiplication by a quaternion. Performing 4 such multiplications will scale an arbitrary vector by a factor of π^4 and return it to its original orientation.

One of the beautiful things regarding the wave equation is that a solution to it can be used to produce other solutions if certain criteria are true. Therefore, if you begin with a solution - hopefully the electron is a solution - and scale it by a factor of π^4 , it is possible that you still have a solution. With respect to the proton, this reasoning still needs a factor of 6π . The factor of π can be rationalized by using the circumference of the circle associated with the projected line segment.

At this point, the reader is perhaps thinking that the author has merely traded one coincidence for several coincidences. The reader might be correct. But consider this. By setting $L_1 = d$, the length of the circumference of the circle associated with the initial line segment, the length of L_2 , and the length of the projected line segment are each equal to πd . Therefore, the object shown in Figure 1 can be constructed using 3 line segments of arbitrary and equal length πd . The associated half-angle is 26.565° with a value for the tangent of $1/2$. Perhaps this tangent value coincides with spin.

Rationalizing the factor of 6 is a little more difficult, but still achievable. In the previous work² by the author, the author developed a set of functions that were used to produce vector solutions to the wave equation. There were two such functions for each axis (i.e., x-axis, y-axis, and z-axis). These functions could be added together in pairs to produce solutions. The functions did not precisely match the structure presented in Figure 1 but the author believes it is possible to modify them to do so. Therefore,

the author believes that the needed factor of 6 is the result of adding all of these 6 modified functions together.

In the argument presented above, mass must be proportional to length. However, the electron is believed to be a point particle. Therefore, the distances presented in Figure 1 must either be scalar values with no physical dimension or they must be in a direction that cannot be physically accessed. Perhaps this dimension is time or perhaps it is truly a fourth physical dimension. The author suspects that this is a scalar value and that it is linked to the wave-function used in quantum mechanics.

The published value³ for the ratio of the rest mass of the proton to the rest mass of the electron is 1836.15267245(75). Sadly, this value does not precisely match $6\pi^5$. Expressed numerically, the latter value is approximately 1836.118109. At this point, the reader must make a choice. The reader may choose to believe that the argument presented in Figure 1 is false and there is no rationale to explain the similarity between the two presented values i.e., that it is a coincidence. Or the reader may choose to believe that this similarity is more than coincidence.

The author does not believe in coincidence - at least not in the physical sciences. Therefore, the author's choice requires an explanation for the deviation between these two values. The author proposes to use the Lorentz Transformation. Application of the transform to the **ratio** between the given values implies a relative velocity of 0.006136 c! The transform is normally applied to mass rather than to a ratio of masses. The mass of the electron would be expected to be effected by relative motion in the same proportion as the mass of the proton. Therefore, the ratio between the two ratios should be one. An implication of this apparent discrepancy is that the rest frame of our physical universe is moving with respect to something. This something is possibly a scalar field. More importantly, the electron is apparently not affected by this motion. This leads the author to believe that it is the electron that is constant in all frames of reference and that the electron may very well be the scalar field.

Once again, the reader must make a choice. Choose wisely.

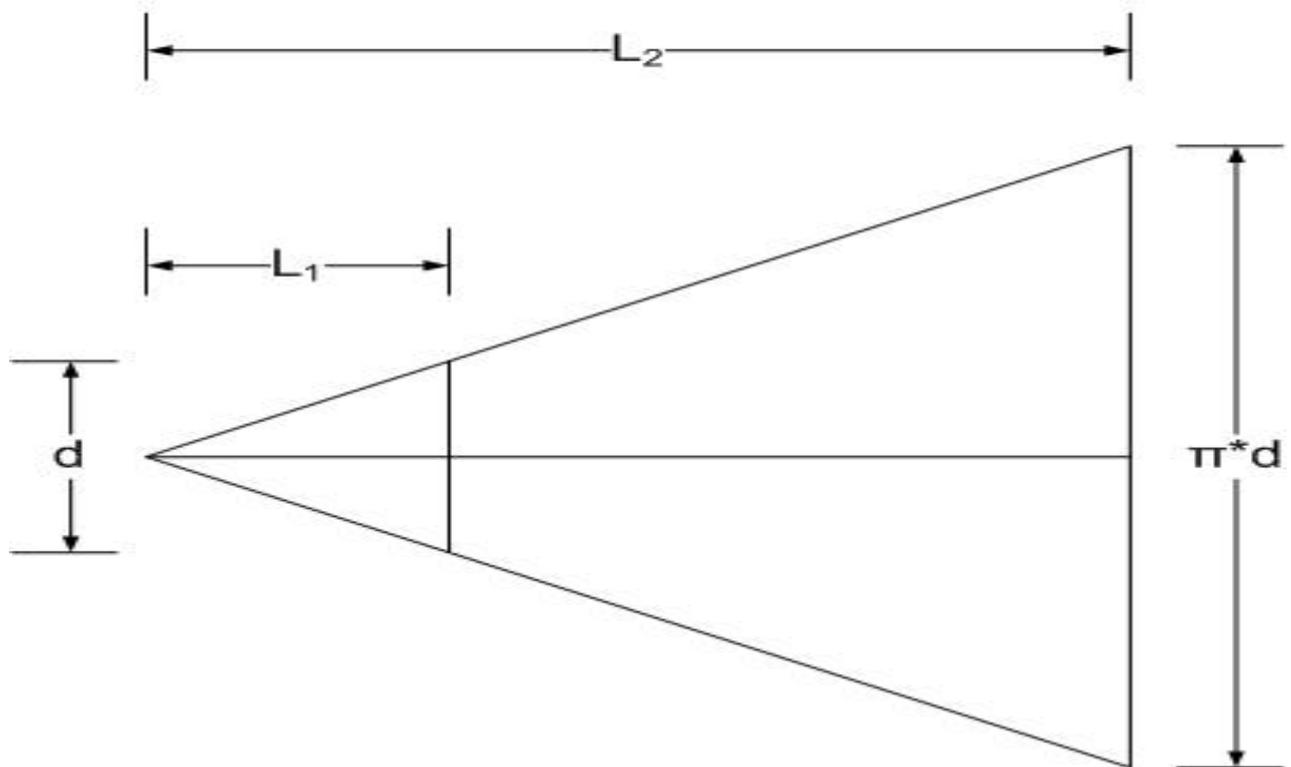
Conclusion

The author believes that the true value for the ratio between the rest mass of the proton and the rest mass of the electron is $6\pi^5$. The author believes that the disparity between the published value for this ratio and $6\pi^5$ is the result of relative movement through a scalar field. Lastly, since the electron is apparently not affected by this relative motion, the author believes that the electron and the scalar field are identical. The electron is the scalar field. The scalar field is the electron. They are the aether.

Acknowledgements

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Figure 1



References

1. Physical Review, May, 1951, p. 554
2. Simpson, G. "The Wave Equation and Rotation", viXra:1208:0064, vixra.org/abs/1208.0064
3. "CODATA Value: proton-electron mass ratio". *The NIST Reference on Constants, Units, and Uncertainty*. US National Institute of Standards and Technology. June 2011. <http://physics.nist.gov/cgi-bin/cuu/Value?mpsme>. Retrieved 2011-06-23.