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Three Relativistic Constants

Janez Špringer*
Cankarjeva cesta 2, 9250 Gornja Radgona, Slovenia, EU

Corresponding Author:** ***Janez Špringer, *Cankarjeva cesta 2, 9250 Gornja Radgona, Slovenia, EU*

Abstract: *The relations between three constants in Heracletean dynamics are presented.*

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1. Introduction

Three relativistic equations are proposed in Heracletean dynamics for mass, time and distance, respectively [1]:

$$m^2c^2a^2 = e^{\frac{m_0^2c^2 - k_m(1-lnk_m) + m^2c^2(a^2-1)}{k_m}}. \tag{1}$$

$$t^2c^2a^2 = e^{\frac{t_0^2c^2 - k_t(1-lnk_t) + t^2c^2(a^2-1)}{k_t}}, \tag{2}$$

$$s_0^2c^2a^2 = e^{\frac{s^2c^2 - k_s(1-lnk_s) + s_0^2c^2(a^2-1)}{k_s}}. \tag{3}$$

Where m_0 , t_0, s_0 represent the ground values, and m, t, s the relativistic values of mass, time and distance. Speed a is expressed in the units of the speed of light c and the dynamics constants are denoted k_m , k_t , k_s.

In the state of zero kinetic energy (ground state) the relativistic and ground values are the same so the equations (1),(2),(3) take the next form (See Appendix):

$$m_0^2c^2a_0^2 = k_m. \tag{4}$$

$$t_o^2c^2a_0^2 = k_t. \tag{5}$$

$$s_0^2c^2a_0^2 = k_s. \tag{6}$$

The relativistic constants are then related as follows:

$$k_t = \frac{t_o^2}{m_0^2}k_m. \tag{7}$$

$$k_s = \frac{s_o^2}{m_0^2}k_m. \tag{8}$$

Since $t_0 = \frac{s_0}{c}$ and $s_0 = \lambda = \frac{h}{m_0c}$ we have:

$$k_t = \frac{h^2}{{m_0}^4c^4}k_m. \tag{9}$$

$$k_s = \frac{h^2}{{m_0}^4c^2}k_m. \tag{10}$$

And

$$k_s = k_tc^2. \tag{11}$$

For approximate calculations the next formulas can be used [1]:

$$m^2c^2 \approx \frac{m_0^2c^2 + k_mlnk_m}{a^2k_m + 1 - a^2}. \tag{12}$$

$$t^2c^2 \approx \frac{t_0^2c^2 + k_t lnk_t}{a^2k_t + 1 - a^2}. \quad (13)$$

$$s_0^2c^2 \approx \frac{s^2c^2 + k_s lnk_s}{a^2k_s + 1 - a^2}. \quad (14)$$

At the zero dynamics constants $k = 0$ Heracletean dynamics transforms to Einsteinian dynamics as follows:

$$\frac{m}{m_0} = \frac{t}{t_0} = \frac{s_0}{s} = \sqrt{\frac{1}{1 - a^2}}. \quad (15)$$

2. Conclusion

The relativistic dynamics constants are defined by the ground physical parameters: mass m_0, time t_0, distance s_0 and speed a_0.

3. Appendix

For $x = x_0$ we have:

$$x_0^2c^2a_0^2 = e^{\frac{x_0^2c^2 - k(1 - lnk) + x_0^2c^2(a_0^2 - 1)}{k}}. \quad (16a)$$

And

$$x_0^2c^2a_0^2 = e^{-1 + lnk + \frac{x_0^2c^2a_0^2}{k}}. \quad (16b)$$

What holds true only when

$$x_0^2c^2a_0^2 = k. \quad (16c)$$

Dedication

This fragment is dedicated for the precious fiftieth anniversary (1969-2019) to the Bridge of Friendship between Slovene Gornja Radgona and Austrian Bad Radkersburg

References

[1] Janez Špringer, (2019). Relativistic Time and Distance in Heracletean Dynamics. International Journal of Advanced Research in Physical Science (IJARPS) 6(9), pp 1-2, 2019.

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