Short Communication

A simple experimental verification for Einstein's variance of mass with velocity equation

M. Sivasubramanian[1] and S. Kalimuthu[2]

[1]Department of Mathematics, Mahalingam College of Engineering and Technology, Pollachi Via, Tamilnadu-642003, India.
[2]Kanjampatti P. O. Pollachi Via Tamilnadu-642003, India.

Einstein's variance of mass with velocity equation is given by $m = \dfrac{m_0}{\sqrt{1 - \dfrac{v^2}{c^2}}}$ **where m is the moving mass of the particle, m_0 is the rest mass of the particle, v is the velocity of the particle and c is the light velocity. In this work, this theoretical result was verified by a simple experiment, PACS: 03.+30.+P.**

Key words: Special theory of relativity, mass-velocity equation, experimental verification.

INTRODUCTION

Einstein's relativity theory is a milestone/landmark/turning point in the history of theoretical physics. All the result of special and general relativity theories have been experimentally verified. Kaufmann, Bucherer, Guye and Lavanchy experimentally established mass-velocity equation in high speed electrons or β - rays. But this experiment can not be understood by a layman. In this work, the authors proposed a simple experiment and proved the theoretical result.

Experiment

Choose an 1HP (1 horse power) electric motor whose RPM (Rotations per min) is 1440. Take 2 single cell torch lights made by one and the same company. Take 2 single tiny 1.5 V battery cells made by one and the same company. Fix 1 of the torches to a wheel of the motor. Let the second torch light be at rest. Now switch on the torch lights simultaneously and switch on the electric motor at the same time. In our experiment the torch light at rest (Figure 1) on an average gave light only for 90 min whereas the torch light in motion

(Figure 2) on an average emitted light for 101 min, that is, the torch light at motion gave light more than 11 min than the torch light at rest. From this, we get the moving mass (the torch light in motion) is greater than the rest mass, (the torch light at rest). And hence the proof for Einstein's mass-velocity equation.

DISCUSSION

According to special relativity, the moving mass is greater than the rest mass of a particle. Although various experiments verify this result, still it is a mystery. Who puts the mass in the moving object? And how is it possible? If the future studies will be carried out/focused on these questions, many hidden physical phenomenon will be unlocked.

Guye and Lavanchy performed their experiment 2000 times (1 and 2). But the authors repeated the same experiment a number of times as shown in the Table 1. Average time difference for the torch (put on) at motion and the same quality and quantity torch (put on) at rest is 11 min.

ACKNOWLEDGEMENTS

---
*Corresponding author. E-mail: profpk49@yahoo.com.

Figuire 1. Electric motor in motion.

Figure 2. Electric motor at rest.

Table 1. Experimental data.

S. No.	Time Start		Time Finish		Difference in time (min)
	Torch at Motion	Torch at Rest	Torch at Motion	Torch at Rest	
1	9.00 a.m.	9.00 a.m.	10.40 a.m.	10.30 a.m.	10
2	10.45 a.m.	10.45 a.m.	12.26 a.m.	12.15 p.m.	11
3	12.30 p.m.	12.30 p.m	2.10 p.m.	01.59 p.m.	11
3	2.20 p.m	2.20 p.m	4.02 p.m.	3.50 a.m.	12
4	4.15 p.m.	4.15 p.m.	5.56 p.m.	5.46 p.m.	10
5	6.05 p.m.	6.05 p.m	7.47 p.m.	7.36 p.m.	11
6	8.00 p.m.	8.00 p.m	9.40 p.m.	9.30 p.m.	10
7	10.00 p.m	10.00 p.m.	11.42 p.m.	11.30 p.m	12

REFERENCES

www.math.ucr.edu/home/baez/physics/relativity/sr/experiments.html-145k
www.2corepower.com.8080/-relfaq/experiments.html-20k-