No Tachyons!

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A B S T R A C T

In 1962, Sudershan and his co-workers hypothesized that particles whose rest mass is imaginary can move faster than light. They have extended Einstein's special relativity to tachyons. Their mathematical concept is very simple. It states that if the rest mass m0 is imaginary and the velocity v of the particle is greater than c, then imaginary parts in the denominator and numerator cancels out the moving mass of the particle/object becoming real and positive. This mathematical application is acceptable but still the question arises whether tachyons are for real or not. In this brief note/short communication, the author attempts to show that both the existence and gen- eration of tachyons are impossible.

KeywordsSpecial Relativity, Sudershan Hypothesis, Tachyons, Mathematical Hurdles

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1. Results

Let us assume that,

$$T_1 + T_2 = e \tag{1}$$

$$T_1 - T_2 = w \tag{2}$$

Where e and w are addition and subtraction velocities of Tachyons T_1 and T_2 respectively.

Adding (2) and (3), $2 T_1 = e + w$ (3)

Subtracting (2) from (1), $2 T_2 = e - w$ (4)

Multiplying the above two relations, $4 P_1 P_2 = (e + w) (e - w)$ (5)

Now applying 4c for T_1 and 3c for T_2 in (5) ,

we obtain that, $4 (4c) (3c) = (4c + 3c)(4c - 3c)$

i.e $48c^2 = 7c^2$ (6)

The above relation implies that $41 = 0$ (7)

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2. Discussion

Eqn. (7) is an arithmetic contradiction. There are four fundamental operations of number theory, namely addition, subtraction, multiplication and division. Multiplication is the easiest way of Addition and division is the shortest form of subtraction. This implies that addition and subtraction are the prime operations of number theory. We have applied only these two operations from eqn. (1) to eqn. (7). Our only assumption is T_1 and T_2. Logically and mathematically this is acceptable. But we have found a contradiction. Our application of this number theory HOLDS GOOD for all physical phenomena. So, a brief analysis makes us arrive at a conclusion that either the existence or the generation of tachyons is not possible! [1-3]

REFERENCES

[1]   Bilanuik, O.M.P., V.K. Deshpande and E.C.G. Sudarshan, Am. J. Physics, 30, (1962), 718- 723

[2]   Arons M.E. and Sudarshan E.C.G. Phys. Rev. 173, (1968) ,1622.

[3]   Dhar J and Sudarshan E.C.G., Phys. Rev., 174 (1968), 1808.