

Refutation of a Gerhard W. Bruhn paper

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The following is a refutation of the paper: Bruhn, G. W. (2006), *No Lorentz property of M W Evans' O(3)-symmetry law*, Physica Scripta, 74(5), 537–538.

Detailed Points of Refutation

The correct way to transform the B Cyclic Theorem is well known and described in great detail in the literature [1*].

Bruhn refers to an Eq. (1.1) which does not appear in the text until halfway down Page 2.

The real part of $B^{(1)}$ is

$$\begin{aligned} \operatorname{Re} \left(\frac{B^{(0)}}{\sqrt{2}} (i - ij)(\cos \phi + i \sin \phi) \right) \\ = \left(\frac{B^{(0)}}{\sqrt{2}} (i \cos \phi + j \sin \phi) \right) , \end{aligned} \quad (1)$$

which is trivially apparent.

The Bruhn equation (1.5) is also trivial:

$$\frac{1}{2}(B_x^2 + B_y^2) = B_z^2 . \quad (2)$$

After Lorentz transformation (assuming that Bruhn did the math correctly), it becomes:

$$\frac{1}{2}(B_x'^2 + B_y'^2) = \frac{1-\beta}{1+\beta} \frac{1}{2}(B_x^2 + B_y^2) = \frac{1-\beta}{1+\beta} B_z^2 = \frac{1-\beta}{1+\beta} B_z'^2 . \quad (3)$$

Equations (2) and (3) demonstrate Lorentz covariance of the B Cyclic Theorem. This is because Eq. (3) is of the same form as Eq. (2).

The factor β is

$$\beta = \frac{v}{c} . \quad (4)$$

However, the B Cyclic Theorem applies to a wave travelling at c . Consequently, in Eq. 4,

$$v = 0 . \quad (5)$$

Therefore, Eq. (3) is the same as Eq. (2). Q.E.D.

Note that the argument is that an electromagnetic plane wave travelling at c , ($B^{(1)} = B^{(2)*}$), cannot travel faster than c .

A reasonable conclusion would be that either Bruhn does not know this rule or he has deliberately contrived an "error".

[*] For additional information, please see (aias.us):

- UFT Paper 89, Appendix 2: *Proof of the Lorentz Invariance of the B Cyclic Theorem*. (Notice the explanation in the last paragraph about how the factor $B^{(0)}$ cancels out. This critical factor is equal to $\kappa A^{(0)}$ (see Paper 89, Appendix 3), which contains the Lorentz-variant wave number κ .)
- UFT Paper 89, Appendix 10: *Rebuttal of G. Bruhn's Comments on the Lorentz Covariance of the B Cyclic Theorem*.

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