

A WRONG FORMULA OF FIZEAU

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Abstract: The experiment of Fizeau has nothing to do with the theory of relativity.

Examination

Fizeau's experiment with moving water^[1] is one of the most important for the theory of relativity. The results of this experiment are confirmed repeatedly, albeit partially. Dephasing of the rays is a fact, but Fizeau's formula for it is wrong and that's why the calculations do not match the data.

The correct formula that follows from the classical law of velocity-addition and that should Fizeau use is:

$$D = c' \cdot \left(\frac{L}{c' - v} - \frac{L}{c' + v} \right) \quad (1)$$

D - dephasing

c' - speed of light in water

L - water flow path

v - water flow velocity

Or the equivalent formula:

$$D = L \cdot \left(\frac{c'}{c' - v} - \frac{c'}{c' + v} \right) \quad (2)$$

Whereas Fizeau uses the formula:

$$D = L \cdot \left(\frac{c}{c' - v} - \frac{c}{c' + v} \right) \quad (3)$$

c - speed of light in vacuum

He replaces *c'* with *c* but this is unnecessary because there is no vacuum in his device and in principle the entire experiment is in water. A similar error is made by the relativists too. Moreover the dephasing calculated with the classical formula, almost coincides with the newer experimental data, while the calculated dephasing by Fizeau is about a quarter bigger and does not match the data. Separately, in the Fizeau interferometer there is also an unaccounted Doppler effect. All in all the classical physics is enough and the relativistic hypotheses are meaningless.

Reference

[1] Fizeau, „On the Effect of the Motion of a Body upon the Velocity with which it is traversed by Light.“, 1859.