

Comment on 'Theorem on the proportionality of inertial and gravitational masses in classical mechanics'

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LETTERS AND COMMENTS

Comment on 'Theorem on the proportionality of inertial and gravitational masses in classical mechanics'**B Jancovici**

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Abstract. A paper which has been published in this journal (Chubykalo A E and Vlaev S J 1998 *Eur. J. Phys.* **19** 1) should never have been accepted.

As a member of the Editorial Board of this journal, I have the unpleasant duty to point out, for those few readers who might not have noticed, that the paper 'Theorem on the proportionality of inertial and gravitational masses in classical mechanics' [1] has been published although it is erroneous.

Indeed, the authors' claim that the equivalence principle (i.e. that the ratio η of inertial m_i to gravitational mass m_g has the same value for all bodies) can be derived *ex nihilo*, rather than being merely accepted as an experimental fact, is hard to believe, to put it mildly. Reading the paper, one realizes that, after calculations about the Kepler problem, the purpose of which is rather obscure, it comes to the key point, i.e. trying to prove

that η has the same value for all bodies. This statement is 'derived' from an equivalent statement (equation (19)) made on the sole basis of 'it is clear that ...'.

A very simple disproof of the authors' argument is that the same argument, applied to the electric charge rather than to the gravitational mass, would lead to the 'proof' that all particles have the same charge-to-mass ratio.

Reference

- [1] Chubykalo A E and Vlaev S J 1998 Theorem on the proportionality of inertial and gravitational masses in classical mechanics *Eur. J. Phys.* **19** 1