COMMENTS

Comments are short papers which criticize or correct papers of other authors previously published in the **Physical Review.** *Each Comment should state clearly to which paper it refers and must be accompanied by a brief abstract. The same publication schedule as for regular articles is followed, and page proofs are sent to authors.*

Comment on ''Experimental proof of standard electrodynamics by measuring the self-force on a part of a current loop''

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We discuss the paper of Cavalleri *et al.* [Phys. Rev. E **58**, 2505 (1998)] on the measurement of a force on part of a closed circuit carrying a constant current.

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In this Comment we make a few remarks as regards the Cavalleri *et al.* paper [1]. An experiment analogous to this one had already been published in the literature [2], although it was not quoted by the authors. Moyssides also performed numerical sixfold integrations to obtain the force on a part of a circuit carrying a steady current and compared his theoretical results with the experimental data. He calculated the sixfold integral of Biot-Savart-Lorentz force law (or Grassmann's force) in [3], analogous to the Cavalleri *et al.* calculation. But Moyssides also calculated the sixfold integral of Ampère's force law [4]. The two expressions did agree with one another and with the experimental findings for closed current loops.

In their paper Cavalleri *et al.* mention that ''a comparison of theory and experiment could not be done before the advent of modern computers.'' As a matter of fact, the theoretical sixfold integration can be done analytically without computers, as was done in 1996 [5]. In this paper fourfold integrals for bidimensional current flow and sixfold integrals for three-dimensional current flow were calculated. The calculation was performed not only for Grassmann's force law but also for Ampère's force law.

A last aspect to be mentioned is that several authors have proved in the last few years that Ampère's and Grassmann's force laws always yield the same result when we calculate the net force on part of a closed circuit of arbitrary form due to the whole circuit, if all lines of current form closed loops. As these references were not quoted by Cavalleri *et al.*, we list a few of them here [2,5,6–18]. This means that their experimental result can be equally explained by Grassmann's force law and by Ampère's force law between current elements.

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