

Premetric Electrodynamics

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Abstract. Classical electrodynamics can be divided into two parts. In the first one, with the use of plenty of directed quantities, namely multivectors and differential forms, no scalar product is necessary. It is called premetric electrodynamics. In this part, principal laws of the theory can be tackled, among them the two observer-independent Maxwell's equations. The second part concerns specific media and requires establishing of a scalar product and, consequently a metric. We present an axiomatic approach to electrodynamics in which the metric enters as late as possible. Also a line of research is mentioned in which the notion of non-inertial observer is studied and its influence on observer-dependent Maxwell equations.

Mathematics Subject Classification (2000). 15A75, 53B50, 78A40.

Keywords. Differential forms, metric, classical electrodynamics, constitutive relation.

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Received: November 5, 2005

Accepted: July, 2006