

# *Reduction of Unknowns in Einstein-Maxwell Field Equations\**

## *I Characteristic [1 1 1 1]*

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**Problem to be solved.** Let us denote by  $g_{\lambda\mu} = g_{\mu\lambda}$  the gravitational tensor field of the signature  $+++-$ , by  $R_{\mu\lambda}$  and  $R$  its contracted curvature tensor and its scalar curvature respectively, by  $\nabla_\mu$  the symbol of covariant derivative with respect to the Christoffel symbols  $\Gamma_{\lambda\mu}^\nu$  of  $g_{\lambda\mu}$ . Moreover let  $k_{\mu\lambda} = -k_{\lambda\mu}$  be the electromagnetic tensor field which is not of the third class.<sup>1</sup> The Maxwell equations will be assumed in the idealized form

$$(1) \quad \partial_{[\omega} k_{\mu\lambda]} = 0, \quad \nabla_\alpha k^{\alpha\beta} = \epsilon u^\beta$$

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<sup>1</sup> *i.e.* is not a null field. For the classification of  $k_{\lambda\mu}$  see V. Hlavatý [2].