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Macroscopic Maxwell's equations of the general theory of relativity

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Abstract

Covariant Maxwell's equations of the general theory of relativity for a system of electromagnetically and gravitationally interacting particles of the form F ik ;k = -4π/c J i, F (ij;k) = 0 are averaged over ensembles of particles with consideration of their electromagnetic and gravitational interactions with a medium. As a result, macroscopic electrodynamic equations are derived for a continuous medium in which the influence of interactions on the macroscopic characteristics of the medium is taken into account. Various manifestations of this influence are completely caused by effects of the general theory of relativity.