

Heaviside-Maxwellian Gravity form Local U(1) Phase/ Gauge Invariance of the Lagrangian for Massive Neutral Dirac Particle

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Received: 21.11.2019 ; Revised : 11.12.2019 ; Accepted : 6.1.2020

Abstract. Starting with Dirac Lagrangian for free massive electrically neutral Dirac particles and demanding local phase invariance, we are forced to introduce a massless vector field (A_g^μ) and to find a complete Lagrangian that generates all of Heaviside's Gravity (HG) of 1893 as well as the relativistic Maxwellian Gravity (MG) which specifies the current produced by massive electrically neutral Dirac particles. The resulting spin-1 vector gravitational theory, named here as Heaviside-Maxwellian Gravity (by establishing the equivalence of HG and MG), is shown to produce attractive force between like masses under static condition, contrary to the prevalent view on vector gravitational theory.

Keywords. Heaviside-Maxwellian Gravity, Gravitomagnetism, Attraction in Spin-1 Vector Gravity, Gravitational Waves (GWs), Speed of GWs.

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