

IMPLEMENTING MAXWELL'S AETHER ILLUMINATES THE PHYSICS OF GRAVITATION: THE GRAVITY-ELECTRIC (G-E) FIELD, EVIDENT AT EVERY SCALE, FROM THE IONOSPHERE TO SPIRAL GALAXIES AND A NEUTRON STAR EXTREME

MILES F. OSMASTON

The White Cottage, Sendmarsh, Ripley, Woking, Surrey GU23 6JT, UK.

E-mail: miles@osmaston.demon.co.uk URL: <http://osmaston.org.uk>

Abstract

Relativity Theory (RT) incorporates serious inconsistencies:- (1) embracing the function of transverse e.m. (TEM) waves as perfect messengers but denying the presence of a Maxwell's equations aether lest it might invalidate that perfection, despite it being essential for their existence; (2) assuming the physical absurdity that the external physical properties (mass, magnetic moment) of fundamental particles can be developed in zero volume ("spatially infinitesimal singularities"), despite powerful evidence that they are of finite size. It thereby overlooks that if two electromagnetically defined objects are of finite size the force communication between them is progressively velocity-limited, falling to zero at c [Heaviside 1889]. So this is what happens in electromagnetic accelerators, not mass-increase. For more than a century these defects have hampered progress in understanding the physics of the mass property of particles, thus compelling it to be regarded as 'intrinsic' to those specific infinitesimal points in space.

A rewarding substitute, **Continuum Theory (CT)**, outlined here, (A) implements Maxwell's aether as a massless all-pervasive quasi-superfluid elastic continuum of (negative) electric charge, and (B) follows others [Clerk Maxwell, both Thompsons, Larmor, Milner] in seeing mass-bearing fundamental particles as vortical constructs of aether in motion, not as dichotomously different from it. To encompass that motion, these cannot be infinitesimal singularities. Electron-positron scattering provides guidance as to that size. For oppositely-charged particles, one sort contains more aether and the other less, so particle-pair creation is 'easy', and abundantly observed, but has been attributed to 'finding'. This electron-positron relationship defines mean aether density as $>10 \times 10^{30}$ coulomb.cm⁻³, thus constituting the near-irrotational reference frame of our directional devices. Its inherent self-repulsion also offers an unfathomable force capability should the means for displacing its local density exist; that, we show, is the nature of gravitational action and brings gravitation into the electromagnetic family of forces.

Under (B) the particle mass is measured by the aether-sucking capability of its vortex, positive-only gravitation being because the outward-diminishing force developed by each makes mutual convergence at any given point the statistically prevalent expectation. This activity maintains a radial aether (charge) density gradient - the Gravity-Electric (G-E) Field - around and within any gravitationally retained assemblage. So Newton's is an incomplete description of gravitation; the corresponding G-E field is an inseparable facet of the action. The effect on c of that charge density gradient yields gravitational lensing.

We find that G-E field action on plasma is astronomically ubiquitous. This strictly radial outward force on ions has the property of increasing the orbital angular momentum of material, by moving it outwards, but at constant tangential velocity. Spiral galaxies no longer require Cold Dark Matter (CDM) to explain this. The force (maybe 30 V.m⁻¹ at solar surface) has comprehensive relevance to the high orbital a.m. achieved during solar planet formation, to their prograde spins and to exoplanet observations. The growth of high-mass stars is impossible if radiation pressure rules, whereas G-E field repulsion is low during dust-opaque infall, driving their prodigious mass loss rates when infall ceases and the star establishes an ionized environment. Its biggest force-effect ($\sim 10 \times 10^{12}$ V.m⁻¹) is developed at neutron stars, where it is likely the force of supernova explosions, and leads to a fertile model for pulsars and the acceleration of 10×10^{19} eV extreme-energy cosmic rays. Our only directly observed measure of the G-E field is recorded at about 1 V.m⁻¹ in the ionosphere-to-Earth electric potential. And temporary local changes of ionosphere electron density, monitored by radio and satellite, have been discovered to act as earthquake precursors, presumably, we suggest, by recording change of G-E field and gravitational potential at Earth surface when its elastic deformation occurs, even when this is deep below electrically conducting ocean water.

The paper concludes by noting experimental evidence of the irrelevance of the Lorentz transformations in CT and with a discussion of CT's competence in such matters as perihelion advance and Sagnac effect, widely regarded as exclusively RT attributes. Finally we broach the notion that the aether is the site of inertia. This could explain the established equality of gravitational and inertial masses.

In an accompanying paper we explore the cosmological and other aspects of 'making particles out of aether'. This link undermines the expectation of fully distinct dynamical behaviour by particles and aether which motivated the Michelson-Morley experiment.

Keywords: Maxwell's aether; gravitation physics; planetary systems; star formation; spiral galaxies; dark matter; neutron stars; supernovae; origin of inertia; Sagnac effect.