

Essay 95 : The Geometrical Structure of Charge and Current
(Written by Myron Evans and Broadcast by Robert Cheshire)

Recently the ECE theory has been extended to provide a geometrical theory of charge / current densities, both magnetic and electric. There are richly structured mathematical solutions of these equations leading to a theory of the internal structure of the electrons and nuclear particles. The equations have been developed in vector notation accessible to engineers and are summarized in the ECE Engineering Model. The magnetic charge current density is thought to vanish experimentally, but even so, the new geometrical structure leads to equations that can be solved simultaneously with others to give numerous new insights. There are four equations available from magnetic charge density, magnetic current density, electric charge density and electric current density, and three more vector equations available from the space part of the Cartan identity. These equations occur in addition to the field equations arising from the Cartan and Evans identities.

Under certain conditions these new equations give a geometrical generalization of the Ohm Law and Coulomb Law. The application of Cartan geometry to the Coulomb law results in resonance behaviour which can be used to describe the way in which electric power can be obtained from spacetime. Devices using this kind of power are being used extensively by Fortune Fifty Corporations and are manufactured by the Alex Hill company (www.et3m.net). The results of Cartan geometry applied to the Coulomb law can be related to solutions of the Helmholtz and Schroedinger equations, and an extra driving term incorporated in the Schroedinger equation to give an Euler Bernoulli equation.

The Schroedinger equation with an extra driving term coming from the vacuum potential of spacetime can be used to give a plausible explanation of low energy nuclear reactions in terms of spin connection resonance. Energy from spacetime is already known to consist of spin connection resonance with driving term. The vacuum is ubiquitous and ever present so the driving term of the Euler Bernoulli equation is ever present. The mathematical structure of the electric charge density includes the spin component of the curvature vector, and it can be shown using these simultaneous equations that the geometrical structure of charge density is equivalent exactly to the geometrical definition of the spin curvature vector. The spin curvature may be that of one electron, so the electron has a rich internal structure coming from spin curvature. So has the proton, and other elementary particles.

In the absence of electric and magnetic fields the vacuum vector potential is not zero, and this fact gives a straightforward explanation of the Aharonov Bohm effects. In the ECE vacuum both the Cartan torsion and the Cartan curvature vanish. The antisymmetric gamma connection vanishes but the spin connection does not vanish, neither does the tetrad. The driving term that gives rise to energy from the vacuum and to low energy nuclear reactions consists of a dot product of the vacuum vector potential and of spin curvature, for example the spin curvature of a nickel nucleus used in LENR technology. All of these insights emerge directly from Cartan geometry with a minimum number of hypotheses.

Similarly the magnetic and electric current densities are defined by Cartan geometry. If it is accepted that experimentation has produced a zero magnetic current density a new fundamental equation can be deduced. The systematic development of these geometrical charge / current densities leads to a large number of new possibilities in electromagnetic and gravitational engineering, and in the inter relation of the two subjects. It was inferred early on in the development of EEC theory that spin connection resonance can play a role in counter gravitational engineering. In theory an electromagnetic device can use spin connection resonance to produce counter gravitation. Without resonance it is unlikely that such a device could be manufactured.

In future work it should be possible to discard the failed particle theory of standard physics and to use geometry to devise an entirely new sub atomic theory in which the sub atomic particles have a geometrical structure.